# Exprodo Database

# User Manual

**October 2015**
**Exprodo Database 7.0.52**

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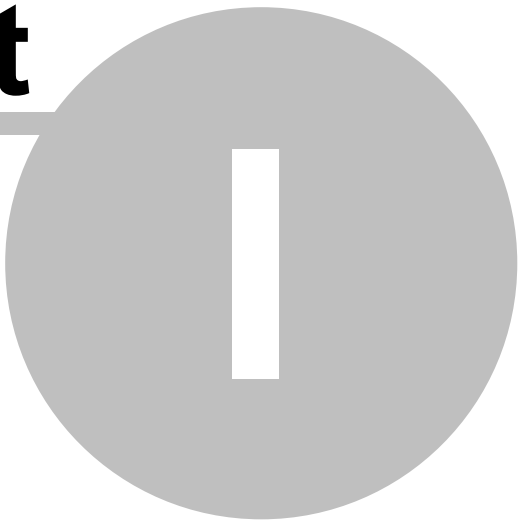
# Part



# 1 Getting Started

**Exprodo Database** (**Exprodo DB**) is a program based on **Exprodo** for creating bespoke database applications.

This documentation was written for version 7.0.52 of **Exprodo DB** and was last changed on October 29, 2015.

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# Part II

# 2 Exprodo DB User Guide

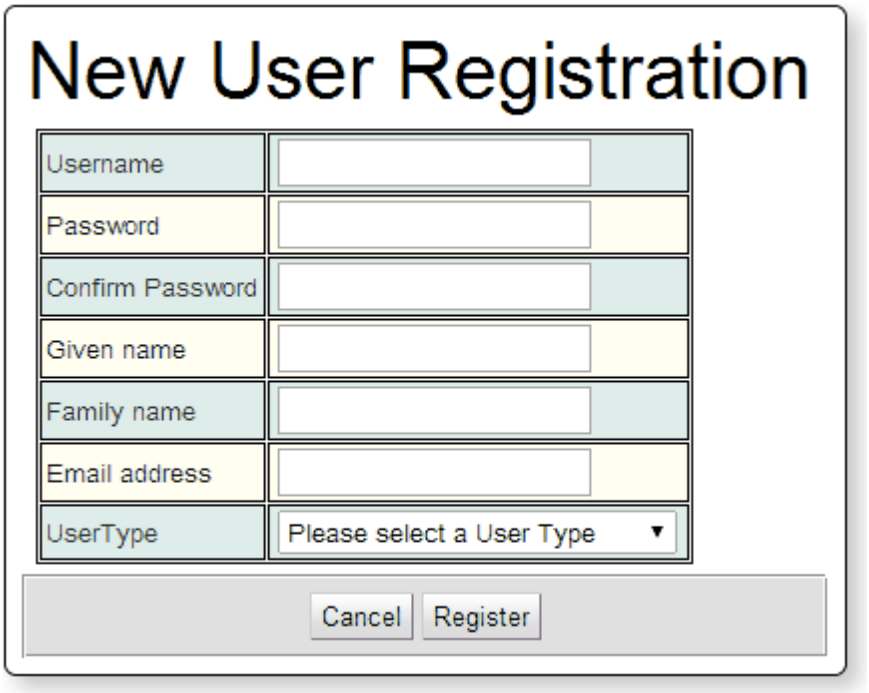
This guide explains how to use **Exprodo DB** to access and search your bespoke database.

## 2.1 Getting A User Account

### Local Exprodo DB Account

To get a local user account, first open a web browser. **Exprodo DB** supports the most popular web browsers - see Web Browser Compatibility 52 for the full list. The administrator should have told you the address of the **Exprodo DB**. When **Exprodo DB** is started, the opening screen will look something like this:

Press the **Register new user** button to see the **New User Registration** form shown here

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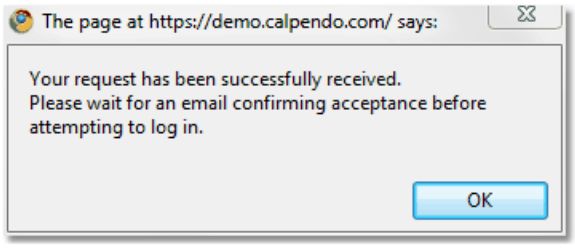
Enter the desired login name, which can consist of letters, numbers, and other characters such as @!:/(). Enter the password that is required by the user with conformation, then enter the given name (usually the first name) and family name (usually the last name). Finally enter the required email address. It is important that the email address is entered correctly because **Exprodo DB** will send an email to confirm it has received the registration request and again to inform when or if the request has been approved and the user can log in. If User Types have been configured you will need to choose one.

Depending on how **Exprodo DB** has been configured, other information may need to be selected.

When all values are entered, press the **Register** button.

If the requested login name, password and email address are acceptable, then a message like this will appear:


The page at https://demo.calpendo.com/ says:
Your request has been successfully received.
Please wait for an email confirming acceptance before attempting to log in.
OK

This means that the registration request has been received, but the user cannot log in yet. They will receive an email to tell them when they can log in using the login name and password selected. Note that the administrator will not know any passwords, nor have any way to find out what they are. However, the administrator is able to reset a password if required.

When a user first logs in to **Exprodo DB**, they will see the Data Explorer 46 page

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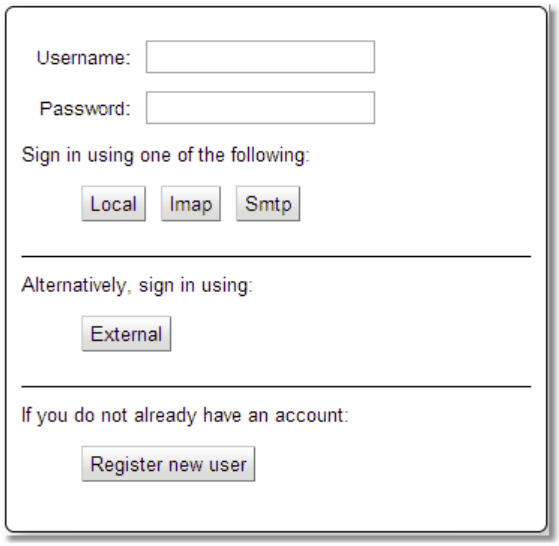
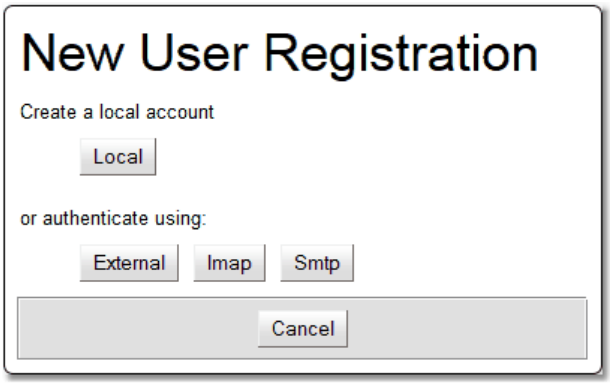
## Single Sign On Exprodo DB Account

Some customer environments use a single sign on. To access **Exprodo DB** using a single sign system a user would need to get authenticated by the single sign on system. To log in click on the button for your sign in system or the **Register new user** button to register using a specific authentication method. The names on the button(s) will have been chosen by the administrator when single sign on authentication is set up so may be different.




If registering a new user choose the system to be registered by. If using a non-local method the user will need to be authenticated by that system before filling in the new registration form.




And then complete the **New User Registration** form, to create an account within **Exprodo DB.**

Once this account has been accepted by the administrator of **Exprodo DB** then the user will be able to login. This enables administrators to control whom has access to **Exprodo DB.**

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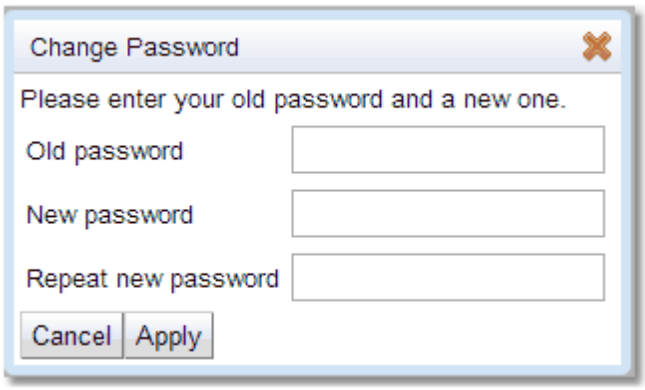
## 2.2 Change Password

If logged in using a local authentication method, in the top-right corner of every page of **Exprodo DB**, there is a **Change Password** link. Click on this if the user would like to change their password. A pop-up will appear that requests the old password and two copies of the new password. Press the **Apply** button to change the password.

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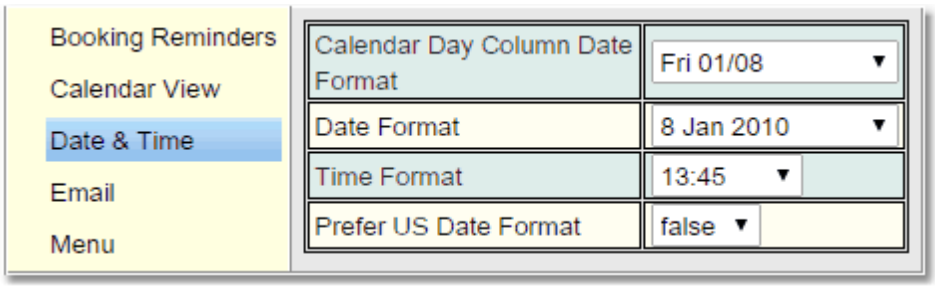
## 2.3 User Settings

The **User Settings** page lets the user configure various options that control how **Exprodo DB** looks. Access it by going to the **Settings** link that is shown in the top-right corner of every page in **Exprodo DB**.

This will show the users settings with several tabs, as described below. Once the settings have been changed then press the **Save** button to save all your changes.

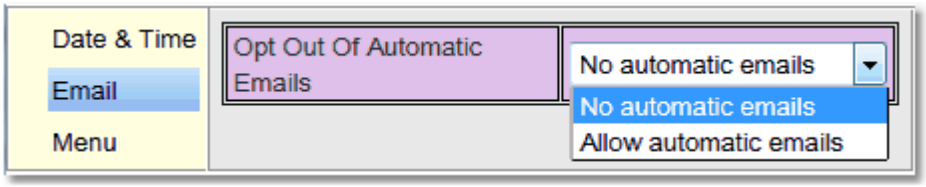
### 2.3.1 Date & Time

This tab allows selection of the format to use for displaying the day and date at the top of each day in any calendar, and also the date and time format used everywhere else. Also specify whether US date format is preferred.




### 2.3.2 Email

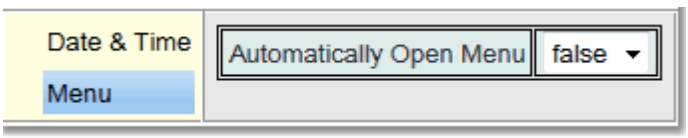
This tab allows the user to choose whether to opt out of automatic emails (not reminders).




### 2.3.3 Menu

This tab allows the user to choose how the menu operates. Either configure it so that each sub menu opens up just by placing the mouse over a menu, or that the user must click on a menu for its sub menu to open.

Also, **Exprodo DB** can show different menus to different user roles. If the user has sufficient *permission*[251] to change their menu, then a drop-down that lets you select which menu you should see will be shown.

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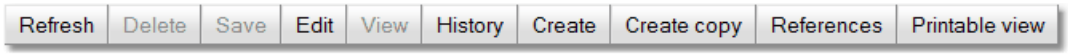
## 2.4 Toolbar Button Standard Definitions

**Exprodo DB** uses toolbars in a number of places to provide options for editing and displaying information. This chapter will define the standard button operations. Below is an example of a toolbar with some options greyed out.




When a toolbar is being described, the text will refer to this chapter, and describe either those buttons not mentioned here or whose operation is significantly different from the norm.

### Editing Buttons

| Button | Description |
|---|---|
| **Edit** | The **Edit** button is greyed out if there is no item selected, or the user does not have *permission* 251 to edit the item. Pressing the button put the item into **Edit** mode. There will be a warning if another user is already editing the *Biskit,* and if the *Biskit* has the **Version Property** *meta-property* 251 set up, then the user will be warned if an older version is being edited, |
| **Apply** | The **Apply** button is active only while an item is in edit mode. Press it to save the item, and stay in edit mode. |
| **Save/OK** | The **Save/OK** button is active only while an item is in edit mode. Press it to save the item, and the item will revert back to a read-only view. |
| **Cancel** | The **Cancel** button is active only while an item is in edit mode. Press it to throw away any changes since the last **Apply** (if there is an **Apply** option on the menu) and move out of edit mode. |
| **View** | The **View** button is used to revert back to a view of the item's details, in read-only mode. If there is no item selected, or the item's details are already shown in read-only mode, then the button will be greyed out. |
| **Delete** | The **Delete** button is greyed out if there is no item selected, the selected item cannot be deleted due to *Permissions,* or it is being *referenced* 252 by something else. If there are many things in the database that reference the item, then it may be difficult to delete it, because the *references* must be removed first. Press to delete the selected items from the database. |
| **Create** | The **Create** button will create a new item of the selected type, but it will be greyed out if the user does not have *permission* to create items of that type. Once pressed, the item will go into edit mode. The item will not exist in the database until either **Save** or **Apply** are pressed. |
| **Create Copy** | The **Create Copy** button will create a copy of the selected type, but it will be greyed out if the user does not have *permission* to create items of that type. Once pressed, the item will go into edit mode. The item will not exist in the database until either **Save** or **Apply** are pressed. |
| **Cut** | The **Cut** button cuts the currently selected item, removing it from its current position and puts it in the edit buffer for later use, overwriting the current buffer contents. |
| **Copy** | The **Copy** button takes a copy of the currently selected item and puts it in the edit buffer for later use, overwriting the current buffer contents. |
| **Paste** | The **Paste** button pastes the current paste buffer contents to the currently selected position. |

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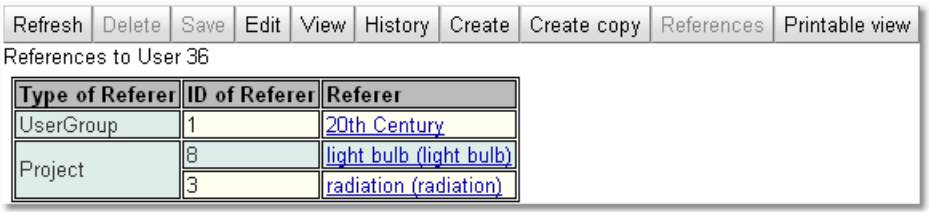
## Viewing Buttons

| Button | Description |
|---|---|
| **Refresh** | The **Refresh** button reloads the current page from the database. |
| **Open All** | The **Open All** button opens up the whole tree so that all the information can be seen. |
| **Close All** | The **Close All** button closes the tree information so only the top of each tree can be seen. |
| **Printable View** | The **Printable View** button will reformat the page to make it printer friendly, including removing the list of items and retaining only the selected item. Then use the browser's **Print** option to print the item's details. Click anywhere on the page to revert back to the normal view. |
| **Columns...** | The **Columns...** button allows the user to decide which *properties* 252 will be displayed. The default is always the **Name** *property*. |

## The References Button

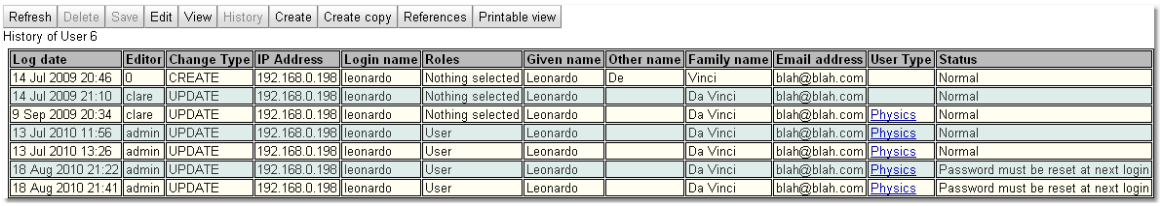
This button will show a list of everything that *references* the currently selected item. It will be greyed out if there is nothing referring to the item. Once pressed a list of the *references* will be viewed:




This shows a table with the *Biskit Type* 250 of the referrer, the unique database identifier of the referrer and its name. Either press the **References** button again, or press the **Back** button on the browser, to return to the original view.

## The History Button

This will show a change *history* 251 of the selected item, like this:




This shows who has changed the item and when, and also shows some of the item's *properties* 252 as they changed over time. The "complex" *properties* are not shown. **Exprodo DB** does not record the history of *properties* that store lists of items, like lists of *projects* 251 and lists of *user groups* 252. The **History** button will be greyed out if there is no item selected or if the item's *history* is already being shown. To revert back to showing the item's details, press the **View** button or the **History** button.

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## 2.5 Conditions

*Conditions* 250 are used in several places within **Exprodo DB**, most notably Searching 27, Automatic Emails 116 and Permissions 97. Understanding *Conditions* is essential in order to be able to configure **Exprodo DB** properly because of their pervasive use. Their purpose is to allow you to specify what situations generate an email, or to which situations a Permission 97 applies. The chapter on Setting Search Conditions goes through basic *conditions* and how to use the **Conditions Panel**. This chapter will expand on how to use *conditions* for the more complex tasks required in Automatic Emails 116, and Permissions 97.

### The Anatomy Of A Condition

A *Condition* 250 extracts one or two *properties* 252 from the context and checks whether a *relation* 252 holds true. If it does, the *Condition* is said to match. A *Condition* consists of the following items, in this order:

The **Condition Type** indicates the source of a *property*.
The *Property Path* 252 tells how to reach a *property* from that source.
The *Relation* provides an operator to compare the value of that *property* to another value.
The **Value** provides a value to do the comparison against.
The **Accuracy** specifies how accurate the comparison should be (used with dates).

The **Condition Type** and *Property Path* are always present, but the others may not be. For example, if the user hasn't selected a *Property Path*, then the *Relation*, **Value** and **Accuracy** do not show. If the context does not specify a *Biskit Type* 250, then when a *Condition* is first created, it will look like this:

The above picture shows the default **Condition Type** of **Value** with a red border because **Value** cannot be used without a *Biskit Type* being available in the context. The *Property Path* also has a red border and shows there are no properties available for the same reason. Choosing a *Biskit Type* of anything other than **Any data type** changes the *Property Path* selector to show there are now *properties* that can be selected: :

The *Property Path* selector still shows in red because a *Property Path* is required, but hasn't been selected yet. Clicking where it says **Select a property** would now generate a drop-down menu with a list of all the *properties* that exist on the *Biskit Type* 250 selected in the current context.

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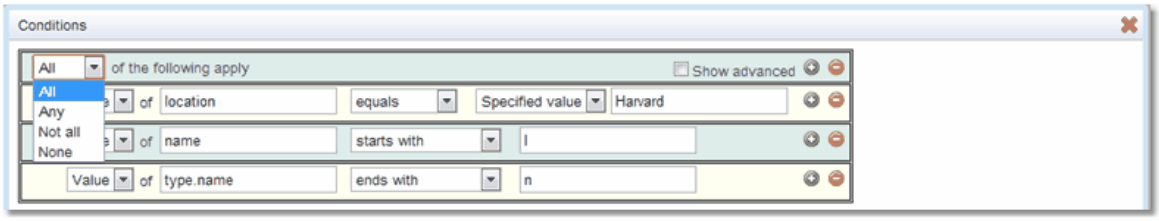
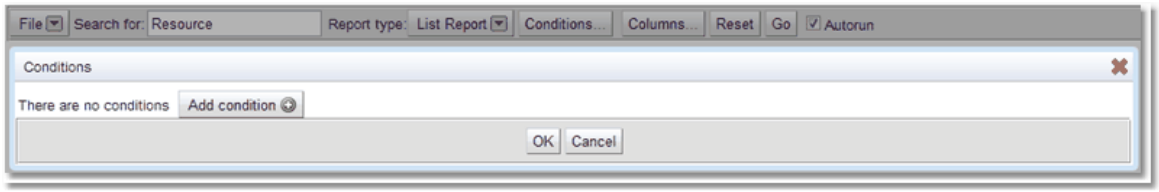
## The Conditions Panel

Everywhere that *conditions* are used, they appear in a panel that looks something like this in a writeable context:




When there are no *conditions*, it looks like this in a writeable context:




When editing *Conditions*, add a new *Condition* by pressing the **Add Condition** button. At any time clicking on the **green +** button will add a new *condition* after the current one, clicking the **red -** button will delete the *condition* the button is associated with.

Whenever there are multiple *Conditions*, they will appear in the **Conditions Panel**, each in their own row.

## The Conditions Context

A **Conditions Panel** is subject to the context within which it is used. There are two parts to the context that affect the way the **Conditions Panel** behaves: the *Biskit Type* 250 the *condition* is being placed upon, and whether used for an update so that there are two instances of the data available (the **Old Value** and the **New Value**) or whether there is just one instance available (the **Value**).

For an Automatic Email 116, the context *Biskit Type* is the type that triggers the email. If the email is triggered by any *Bisikit Type*, then it means the context has no *Bisikit Type*. There's a **New Value** available when the action that triggered the email is an **Update** and not when the action is **Create** or **Delete**.

For a Permission 97, it's a very similar situation. The context *Bisikit Type* is the *Bisikit Type* that the *Permission* 251 controls access to, and if the *Permission* applies to any *Bisikit Type*, then the context has no *Bisikit Type*. The **New Value** is available when the action being controlled is **Update** and not when the action is anything else.

For a Search 27 the context *Bisikit Type* is the *Bisikit Type* that the **Search** is on, and the only **Condition Type** available is **Value**.

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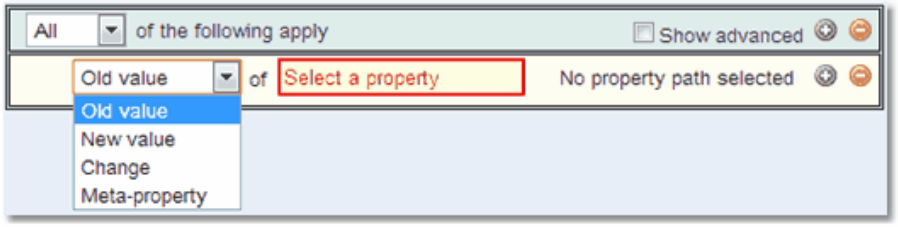
## The Conditions Type

When a *condition* is created or edited, the type has four possible values:




### Condition Type: Old Value

A **Condition Type** of **Old Value** means the *condition* will be placed upon the value of a *property*[252] before any change has been made to it. For a *condition* within an Automatic Email[116] this means the value of the *property* in a **Create** or **Delete** action and the old value of the *property* for an **Update** action. For a Permission[97] this means the value of the *property* on an object somebody is trying to **Create** or **Delete**, and the original value they are trying to change from when somebody is trying to **Update** a *Biskit*[250].

A **Condition Type** of **Old Value** is only suitable when the *condition* context specifies a *bisikit type*.

When a **Condition Type** of **Old Value** is specified, the *property path*[252] will show all the *properties* of the type defined by the context's *bisikit type*, and any *properties* that can be reached from those *properties*. When the context *bisikit type* is set to a **Resource**, clicking where it says **Select a property** shows this:

A *Resource*[252] has a number of *properties*, as shown. One of them, **Location**, is itself an object that has *properties* of its own that can be selected. As soon as you select a *property* from the drop-down, the *Relation*[252] part of the *condition* will change from **No property path selected** to something appropriate for the *property* selected (described further below).

### Condition Type: New Value

A **Condition Type** of **New Value** is only available when a *bisikit type* has been specified, and even then only in some contexts. For an Automatic Email[116], Permission[97] or Booking Rule, a **Condition Type** of **New Value** is only available for the **Update** action. Selecting **New Value** means that the *condition* will be placed on the value of the *property* after the update has occurred. The *property path* will display the same as for a **Condition Type** of **Old Value**.

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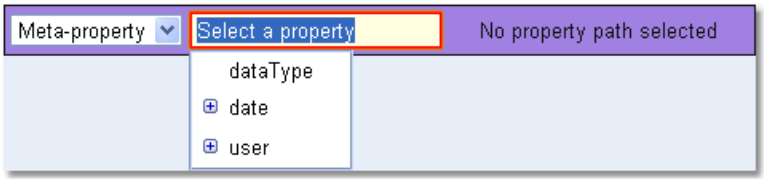
### Condition Type: Change

A **Condition Type** of **Change** is available in the same contexts as **New Value** and the *property path* displays the same as for both **Old Value** and *New* **Value**. This **Condition Type** means that a restriction is placed upon the change of a *property*. For example,it can be restricted so that the *condition* matches when the selected *property* does not change, does change, increases or decreases. The increase and decrease restrictions are only available for *properties* for which such a concept makes sense. This is described further below.

### Condition Type: Meta-Property

A **Condition Type** of **Meta-Property** is available in all contexts. When this type is selected, the *property path* displays the following:




A *Meta-Property* 251 lets you place restrictions on:

- the type of the data that was **Created**, **Updated** or **Deleted**
- the date and time that the action took place
- the user that caused the action

This is called a *Meta-Property* because it's not a *property* of whatever was created, updated or deleted, but rather, it's a *property* of the action itself.

## The Property Path

As described above, the *properties* shown in the *property path* depend upon the **Condition Type** selected. However, each *property* that is shown has it own way of being displayed, regardless of how it came to be there. For example, any date/time *property* that is shown will display with sub-properties.

A *Resource* 252 has a number of properties, as shown. One of them, **Location**, is itself an object that has *properties* of its own that can be selected. The *Relation*, **Value** and **Accuracy** part of the *condition* will not show unless a *property path* has been selected. Once a *property* is selected, the extra parts of the *condition* appear, and they reflect the type of the *property* selected and the choice of **Condition Type**.

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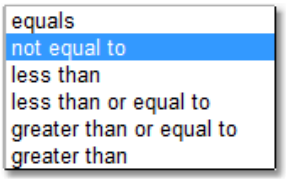
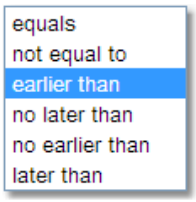
## The Relation

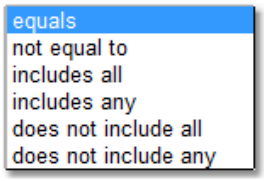
The *Relation* is only shown when there's a *bisikit type* in the context and a *property path* has been selected. The options displayed in the *Relation* drop-down menu differ depending on the type of *property* selected by the *property path*.




This is the standard choice of relations for an integer or floating point number property.

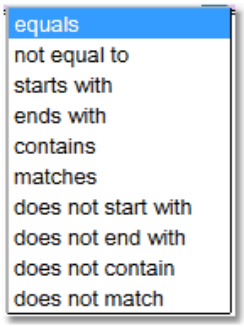



A date *property* displays with semantically identical options, but using different words to match the English you would expect.




Not all integer *properties* display using the above options. That's because some integer *properties* are defined as a bit set of values of named integers (see Bit Sets[190] for details). A good example of this is a *user's roles*[253]. There are up to 32 roles defined, and a user may be deemed to have any number of these roles. For such *properties* it doesn't make sense to compare two sets of roles using greater than or less than, and so the available *relations* are changed to reflect this.

A text *property* displays with options for comparison with the starting, ending or interior characters. Also available is pattern matching using the following:




^ The beginning of the line.
$ The end of the line.
. Any character.
* Zero or more times.
+ One or more times.
? Once or not at all.
X | Y Either *X* or *Y*.
{n} Exactly *n* times.
{n,m} At least *n* times but not more than *m* times.
[a-z] Characters a to z.
[^a-z] Any character other than a to z

Search[27] conditions are not case sensitive, while non-search (Automatic Email[116], Permission[97] or Booking Rule) conditions are case sensitive.

Depending on whether the pattern matching is going to be done in Java (Automatic Email[116], Permission[97] or Booking Rule) or SQL (Search[27]) will depend on which additional matching features are available. It is recommended that users only use the options listed above.

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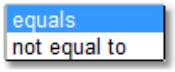
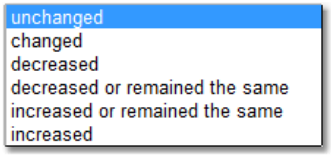



All the remaining *property types* don't support any notion of an ordering that could be used to specify a **less than** *relation* etc. So for these, the relations available are.




All the above *relations* are used when the **Condition Type** is **Value**, **Updated Value** or **Meta-Property**. For a **Condition Type** of **Change**, the *relations* are different. In this case, a comparison between new and an old value are being done. The numeric options available are semantically identical to their original values, but to make it clear what is meant by **less than** in this situation, the wording changes to this.

All the remaining *property* types, including those that used the set of Mapped Integers[188] like *user roles* above, do not support any notion of comparing the new and the old value except for indicating whether there was a change.

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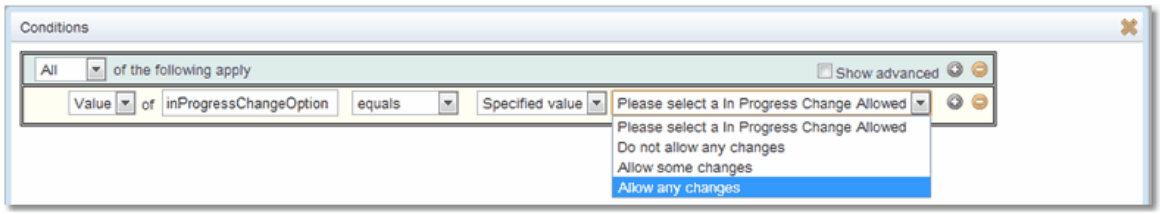
## The Value

A value is not required when the **Condition Type** is **Change**. That's because the **Change** *relation* compares the new and the old values of the *property*, and so does not require a user-specified value to compare against.

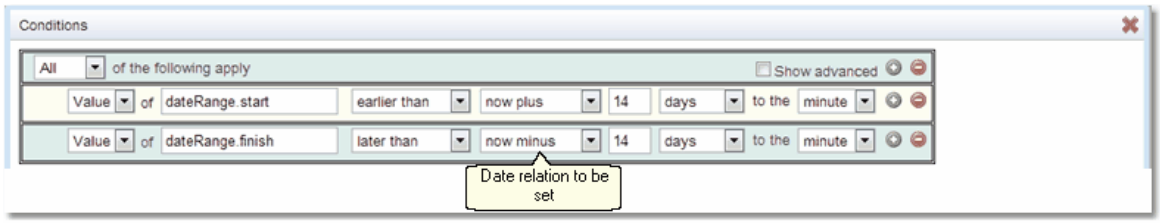
When a value is required, a drop-down menu is shown. Any *property* that is not a date or date-time, it shows this:

This gives a choice between a value that is **null** (a special value meaning there is no value) and **Specified value**. If **Specified value** is chosen then a further item will appear so that the value can be chosen. The item shown for the value entry will be appropriate to the type of the *property* indicated by the *Property Path*.

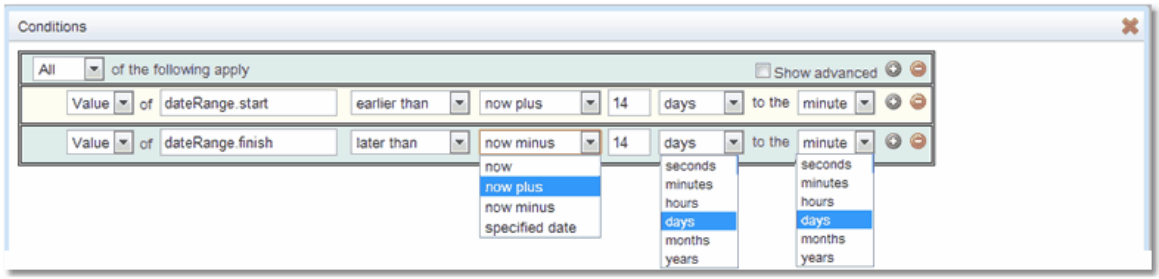



## Date Properties And Accuracy

When dealing with dates there are some other options that are available. Whenever a *property* is asked for which stores a date two *condition* lines will appear, one for the start date and one for the finish date, the *relation* can then be set (see table earlier in the chapter for the full list available) :




Then set how accurate the date checking needs to be. There are four options against which the comparison can be made and then a level of accuracy to be used.

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| Date Accuracy | Description |
|---|---|
| **now** | The time specified but with a level of accuracy. |
| **now plus** | Within now plus a certain amount of time with a level of accuracy. |
| **now minus** | Within now minus a certain amount of time with a level of accuracy. |
| **specified date** | The specified date exactly. (No level of accuracy may be set. |

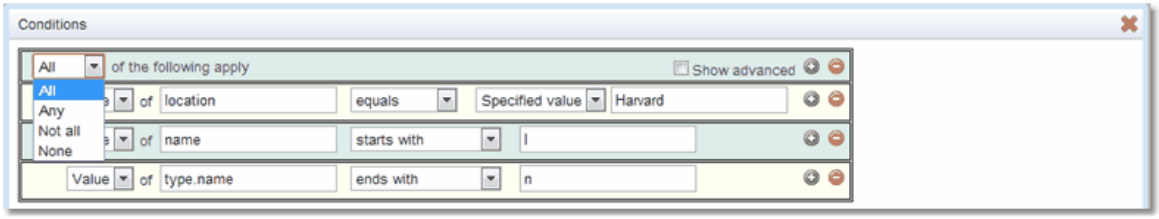
The **now** option means that the value of the *property* to be compared against is to be the date and time that the comparison is done. The **now plus** and **now minus** options indicate that the date to be calculated is relative to the time the comparison is done. When selecting either of these options, a further item is displayed to input how much time to add or subtract from the time of the comparison to reach the date-time that the *property* is being compared against. If the **specified date** option is selected, then a date-time entry is displayed to input the exact point in time to compare the *property* against.

The **Accuracy** is only shown for date or date-time properties, and it specifies how accurately the comparison is to be.

Then, when the *Condition* is checked, and **Exprodo DB** compares two dates, it first rounds both dates down to the year, month, day, hour, minute or second. After rounding both dates, it then compares the dates using the specified *relation*.

## Combination Option

Once all the *conditions* have been created, choose how logically the *conditions* will work together (the combination option). Click on the drop down button in the top left corner of the *condition* box.




| Combination Option | Description (For the combination to be TRUE) |
|---|---|
| **All** | All the individual *conditions* must be true. (Logical AND) |
| **Any** | At least one of the individual *conditions* must be true. (Logical OR) |
| **Not All** | As long as not all the individual *conditions* are true, this includes none of the *conditions* being true. (Logical NAND) |
| **None** | As long as none of the individual *conditions* are true. (Logical NOR) |

This creates the following search *condition*:
*Resources* where (**location.name** starts with **h**) and (**type.name** equals **Room**) and (**requireCancellationReason** equals **True**)
At this point use **OK** to save the *condition* and **Cancel** to start again.

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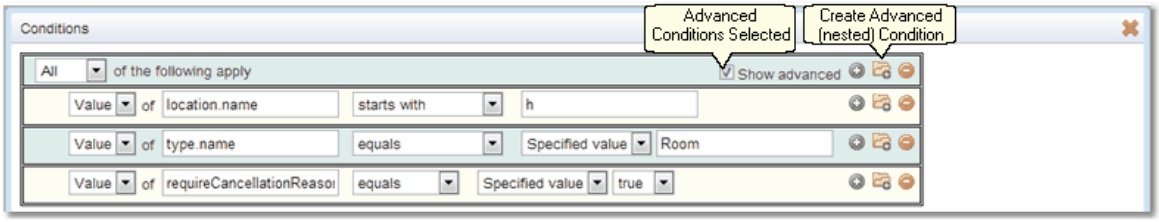
## Nested Conditions

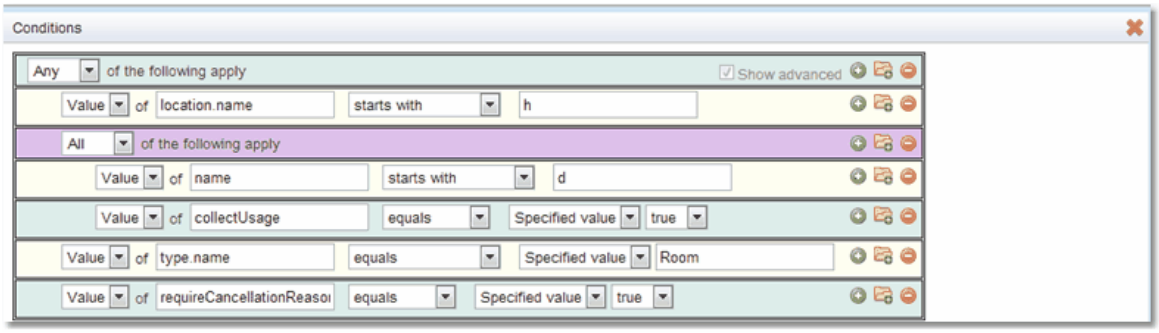
Nested *conditions* allow as many levels of *conditions* as the user requires. Each set of nested *conditions* also has its own combination option allowing the user to create as complex an overall *condition* as possible.

Each nested set of *conditions* is evaluated separately, and the overall result of the nested *condition* is then used as an individual *condition* result as part of the level above's *condition* calculation.

In order to use advanced *conditions* tick the **Show Advanced** box. Once ticked the **Create Advanced Condition** icon appears at the top of the *condition* list and on each of the current *conditions*.


Conditions
Advanced Conditions Selected
Create Advanced (nested) Condition
All of the following apply
Show advanced
Value of location.name starts with h
Value of type.name equals Specified value Room
Value of requireCancellationReaso equals Specified value true

Below the *conditions* have been expanded using a nested *condition*. The nested *condition* has two parts, **name** and **collectUsage** and it will be **True** if both sub *conditions* are **True**.


Conditions
Any of the following apply
Show advanced
Value of location.name starts with h
All of the following apply
Value of name starts with d
Value of collectUsage equals Specified value true
Value of type.name equals Specified value Room
Value of requireCancellationReaso equals Specified value true

This creates the following search *condition*:

*Resources* where (**location.name** starts with **h**) or ((**name** starts with **d**) and (**collectUsage** equals **true**)) or (**type.name** equals **Room**) or (**requireCancellationReason** equals **true**)

In order to test the *condition* the following steps will be used

1. Check the nested *condition*, if both *conditions* are **True** then the nested *condition* is **True** otherwise **False** (**All** *conditions* apply)
2. Check the top level *condition*, if any of the three top level *conditions* are **True** or the nested *condition* is **True** then the whole condition is **True** (**Any** *condition* applies)

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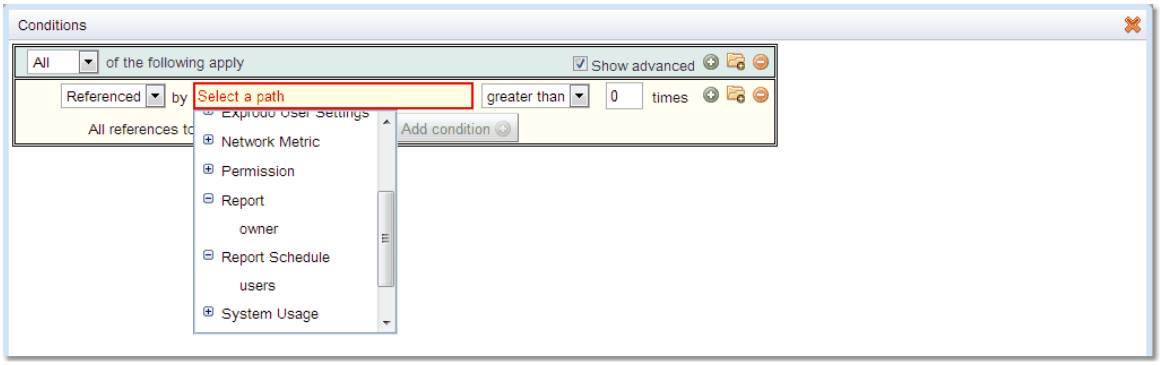
## Referenced

Ticking **Show advanced** allows the use of **Referenced** as a **Condition Type**. Using **Referenced** it is possible to search for *BiskitDefs* 250 that are referenced by other *BiskitDefs*. Using the **Relation Statement** and the **Value** this can be further refined to find those that are referenced a number of times. e.g. more than once, less than three times etc.




When using **Referenced** the application looks for all those *BiskitDefs* that have a *property* which points to the *BiskitDef* that is the object of the search. In this case the search *BiskitDef* is **Exprodo User** the application will give a drop down that lists all the *BiskitDefs* that have a *property* that points to an **Exprodo User** *BiskitDef*. Expanding a *BiskitDef* will list the *properties* that are available. For instance **Report** has an **owner** *property* and **Report Schedule** has a **users** *property*.

As an example to find all those users that have created **Reports**, set **Exprodo User** as the *BiskitDef* to be searched for and **Report.owner** (**owner** is a pointer to an **Exprodo User**) as the *property* defined in the **Property Path**, returned will be a list of **Exprodo Users** that currently have **Reports** in the **Report Manager**. If the **Relation Statement** and **Value** are set to **greater than 1 times**, then only those users with two or more reports will be returned.

***See Also:***

- Example Automatic Emails 126
- The examples in Permissions 97

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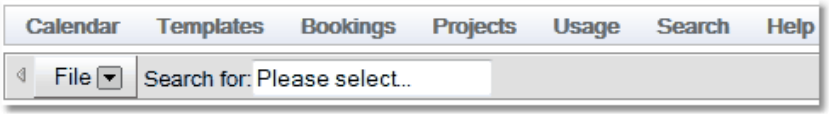
## 2.6 Searching For Information

There are various ways to search for information in **Exprodo DB**, and several ways to display the information found. This section describes the generic search options that apply to any type of data.

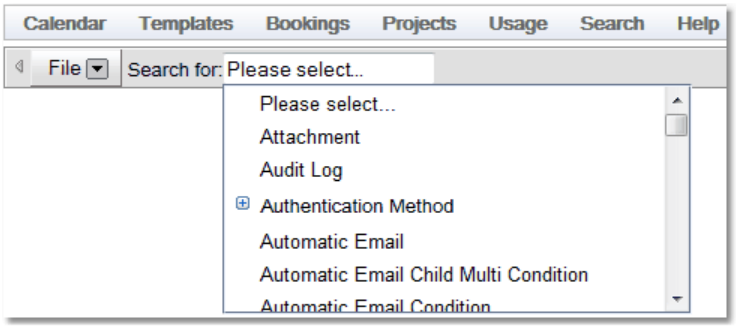
### 2.6.1 Search

The **Search** page allows searches for any type of data within **Exprodo DB**. By default, it appears under the **Search** menu, with a sub menu item also labelled **Search**. However, the menu may have been configured so that the **Search** page is not visible or in a different place.

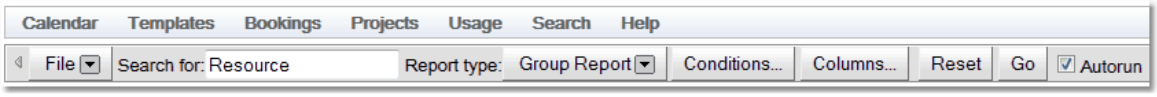
When you enter the **Search** page the following will be seen:




Choose which *Biskit Type*[250] to search for. Clicking on **Please Select** will provide a drop down menu with the complete list of types available to search.




Once a *Biskit Type* is selected additional options will appear.




There are four report types: *List*[251], *Summary*[252], *Single Item*[252] and *Group*[251]. The user can also add *conditions*[250] to the search (not *Single Item*), change the columns that are going to be viewed in the returned search (not *Summary* or *Single Item*), or reset the search *conditions* to the default (not *Single Item*).

This icon will toggle whether the **File** and **Report Type** options are available.

The **Go** button will run the current search set up.

**Autorun** if selected will automatically run new search set ups as they change, so changing **Columns**, ***Conditions***, **Report Type** and even what is being searched for, will get the search to be re-run as each setting is changed. If searches are being done on large amounts of data or the user needs to make multiple changes between search runs it is more efficient if **Autorun** is not selected. If at any time having made changes and **Autorun** is selected but a new search has not run then press the **Go** button.

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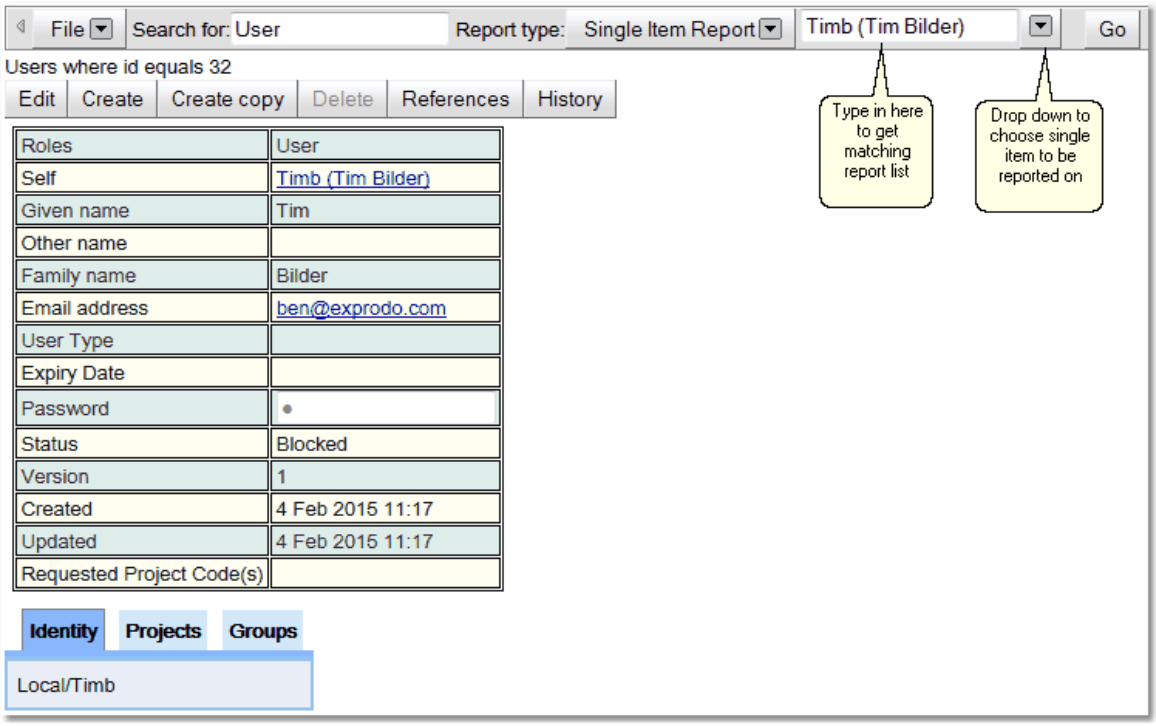
### 2.6.1.1 Single Item Report

Shows the result of the search as a single record.

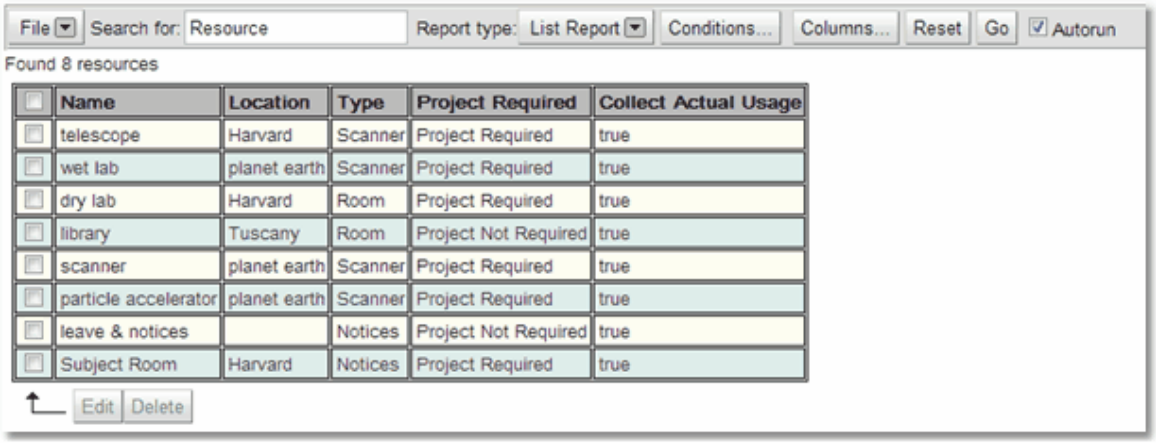



Either use the drop down to get a full list of possible options to be scrolled through or type in the input box to get a shortened list of possible matching objects.

If the user has the correct *permissions* [251] they may edit the individual records or make changes to multiple records. All of this will be covered in the chapter on Editing Search Information [36]

### 2.6.1.2 List Report

Shows the result of the search as a list of records


File
Search for: Resource
Report type: List Report
Conditions...
Columns...
Reset
Go
Autorun
Found 8 resources
Name | Location | Type | Project Required | Collect Actual Usage
telescope | Harvard | Scanner | Project Required | true
wet lab | planet earth | Scanner | Project Required | true
dry lab | Harvard | Room | Project Required | true
library | Tuscany | Room | Project Not Required | true
scanner | planet earth | Scanner | Project Required | true
particle accelerator | planet earth | Scanner | Project Required | true
leave & notices | | Notices | Project Not Required | true
Subject Room | Harvard | Notices | Project Required | true
Edit
Delete

Specify which columns are viewed by clicking on the **Columns...** button and get a drop down list of tick box's for all available *properties* [252], those who have their boxes ticked will be shown.

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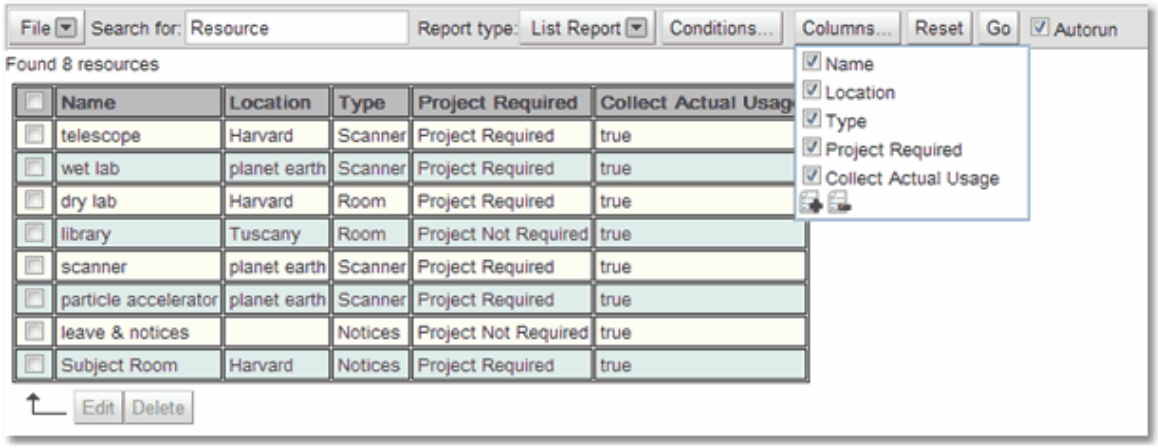


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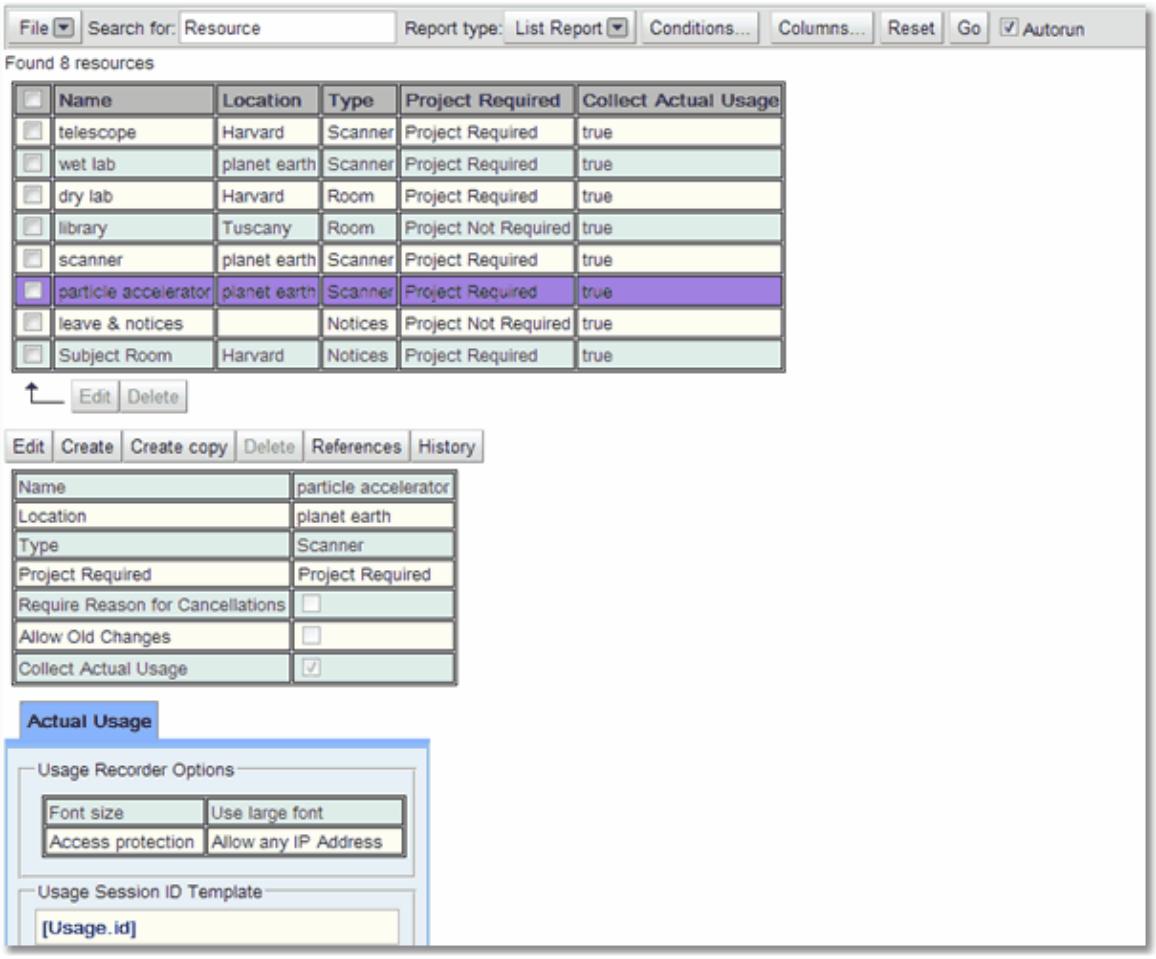
If an individual record is clicked an expanded view of that record will appear below the list.




If the user has the correct *permissions* [251] you may edit the individual records or make changes to multiple records. All of this will be covered in the chapter on Editing Search Information [36].

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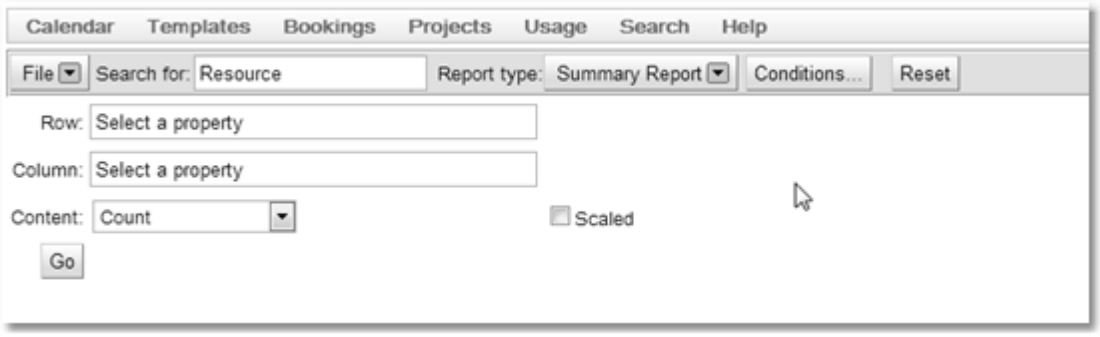
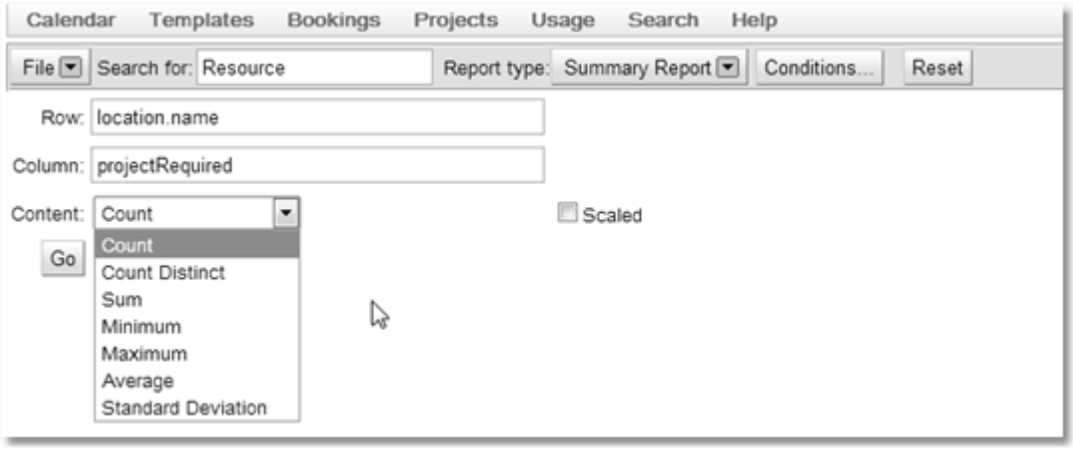
### 2.6.1.3 Summary Report

Shows the report as a table, where the user can define the *properties*[252] that are used for the rows and the columns of the table, and how the content of each cell will be calculated.

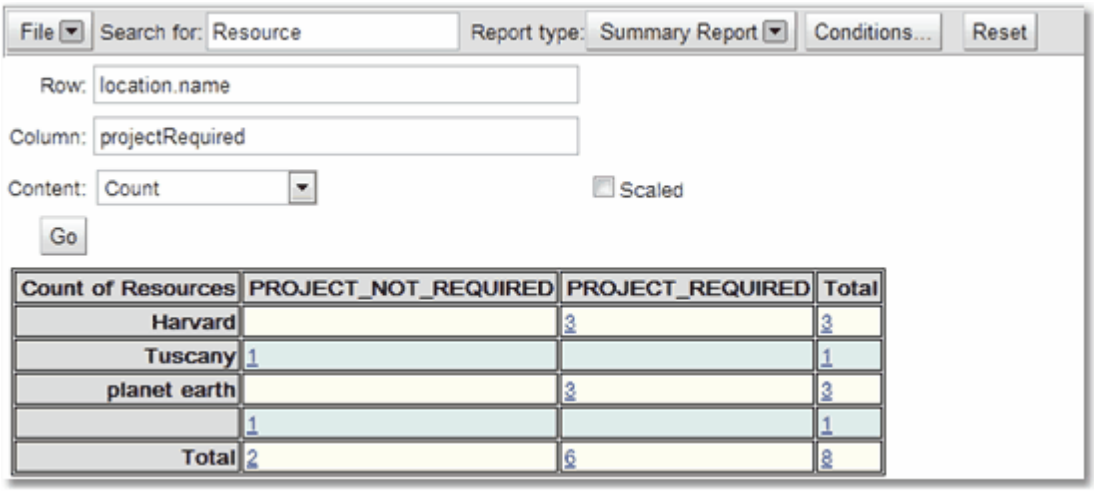
When the *Summary Report*[252] view appears the user will be asked to select the *properties* that will be used for the rows and for the columns.




Once the *properties* have been selected, then select how the content is to be displayed.




The default content display is count, this will display the content as a simple count of how many records match the row/column combination, with totals for each row and column.




| Count of Resources | PROJECT_NOT_REQUIRED | PROJECT_REQUIRED | Total |
|---|---|---|---|
| Harvard | | 3 | 3 |
| Tuscany | 1 | | 1 |
| planet earth | | 3 | 3 |
| | 1 | | 1 |
| Total | 2 | 6 | 8 |

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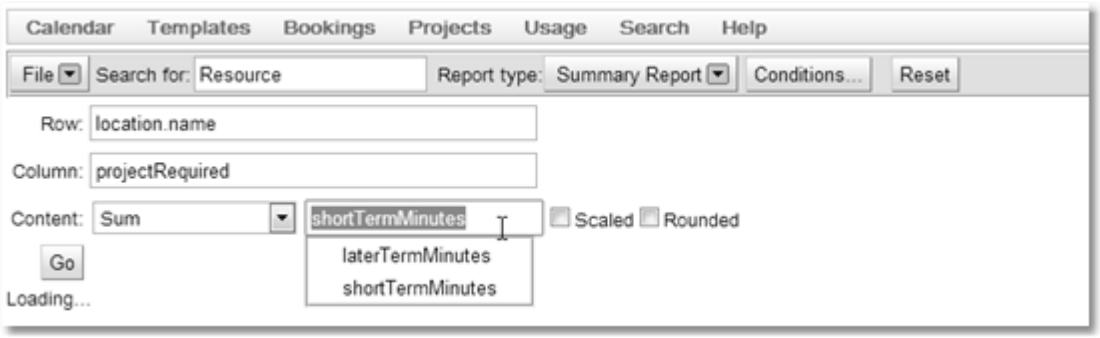
## Complex Content Types

All the other content types require a numerical or date property as an additional parameter (the exception is **Count Distinct** which will work with any type) . The value of this parameter will be used to determine the value stored in each cell.




| Content Type | Description |
|---|---|
| **Count Distinct** | How many different values to the *property* are there for this cell. |
| **Sum** | The total of this *property* for this cell (numerical only) |
| **Minimum** | The smallest value for this *property* for this cell |
| **Maximum** | The largest value of this *property* for this cell |
| **Average** | The average value of this *property* for this cell |
| **Standard Deviation** | The standard deviation of the values of this *property* for this cell. |
| **Value At Minimum Of** | Choose a property to find the minimum of, and the value shown in this column will be the value of the current property when the property being compared with is at a minimum. |
| **Value At Maximum Of** | Choose a property to find the maximum of, and the value shown in this column will be the value of the current property when the property being compared with is at a maximum. |

Below is an example of a table showing the total booking duration in minutes for each *project* 251 for each resource

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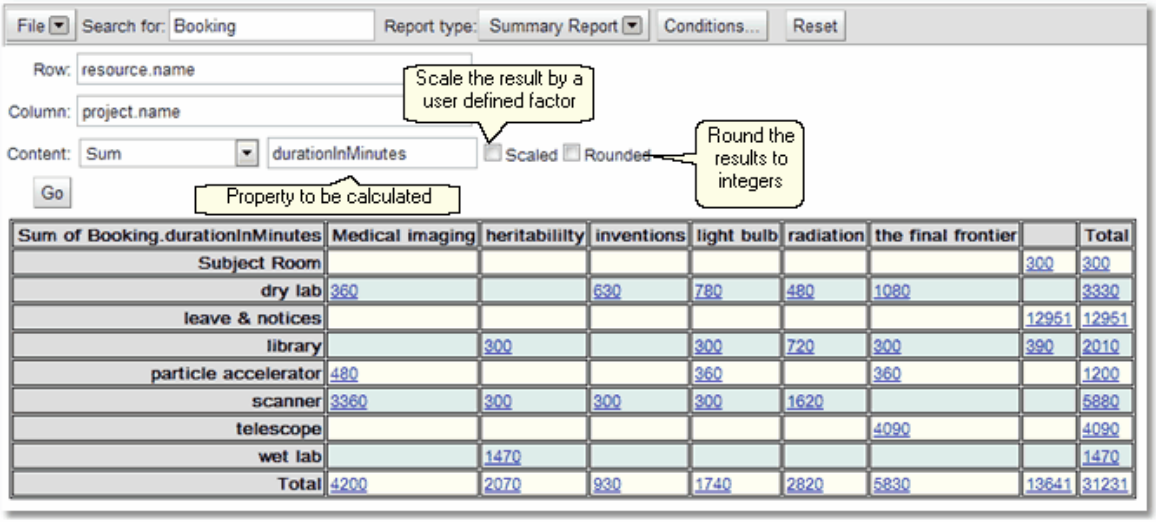
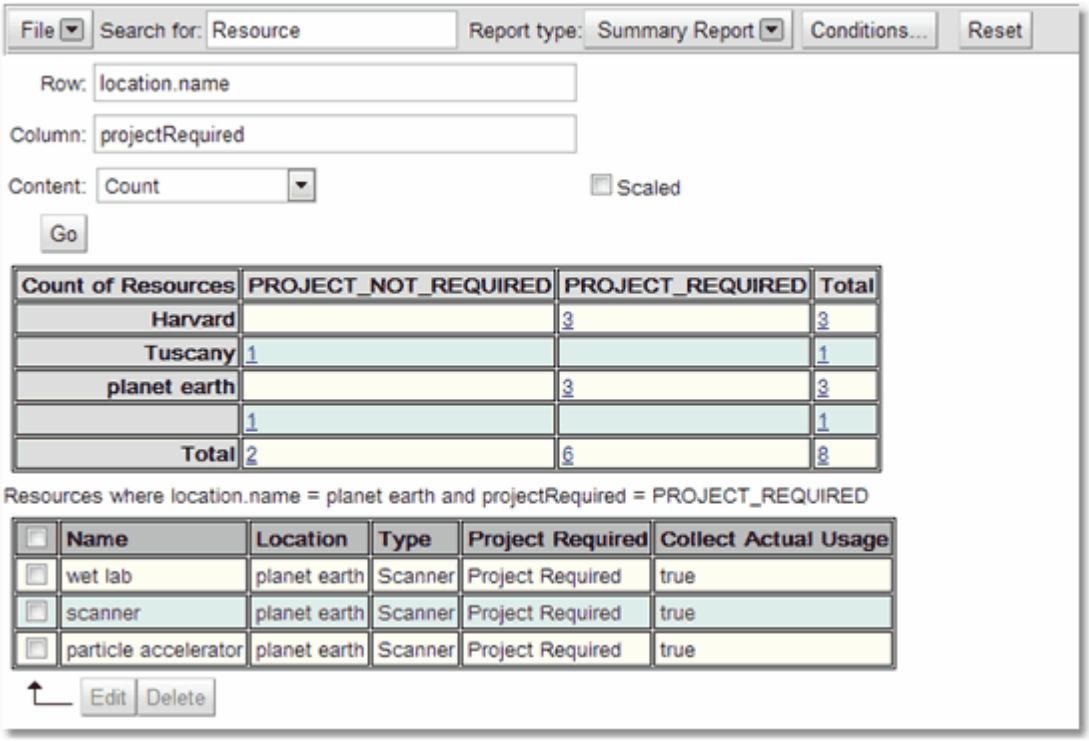



| Sum of Booking.durationInMinutes | Medical imaging | heritabililty | inventions | light bulb | radiation | the final frontier | | Total |
|---|---|---|---|---|---|---|---|---|
| Subject Room | | | | | | | 300 | 300 |
| dry lab | 360 | | 630 | 780 | 480 | 1080 | | 3330 |
| leave & notices | | | | | | | 12951 | 12951 |
| library | | 300 | | 300 | 720 | 300 | 390 | 2010 |
| particle accelerator | 480 | | | 360 | | 360 | | 1200 |
| scanner | 3360 | 300 | 300 | 300 | 1620 | | | 5880 |
| telescope | | | | | | 4090 | | 4090 |
| wet lab | | 1470 | | | | | | 1470 |
| Total | 4200 | 2070 | 930 | 1740 | 2820 | 5830 | 13641 | 31231 |

Use the **Rounded** option to round numbers to integers
Use the **Scaled** option to scale the results by the user requested factor (i.e if the scaling factor is 10 divides all results by 10).

## Viewing Records

Records associated with each cell can be viewed by clicking on the number in the cell. This will give a *List Report*[251] of the records for that cell beneath the table.




| Count of Resources | PROJECT_NOT_REQUIRED | PROJECT_REQUIRED | Total |
|---|---|---|---|
| Harvard | | 3 | 3 |
| Tuscany | 1 | | 1 |
| planet earth | | 3 | 3 |
| | 1 | | 1 |
| Total | 2 | 6 | 8 |

Resources where location.name = planet earth and projectRequired = PROJECT_REQUIRED

| Name | Location | Type | Project Required | Collect Actual Usage |
|---|---|---|---|---|
| wet lab | planet earth | Scanner | Project Required | true |
| scanner | planet earth | Scanner | Project Required | true |
| particle accelerator | planet earth | Scanner | Project Required | true |



As with the *List Report*[28] clicking on an individual record will give an expanded view of that record below the list.

If the user has the correct *permissions*[251] they may edit the individual records or make changes to multiple records. All of this will be covered in the chapter on Editing Search Information[36]

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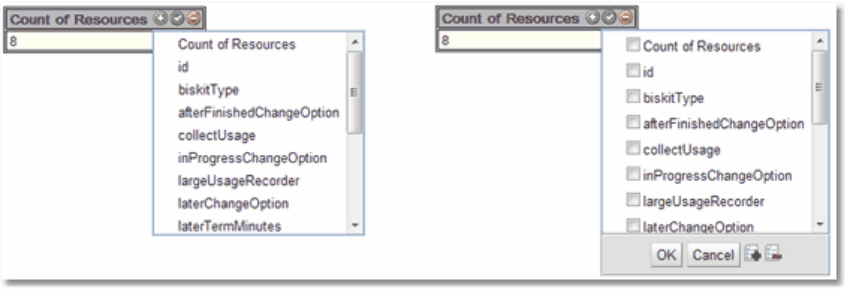
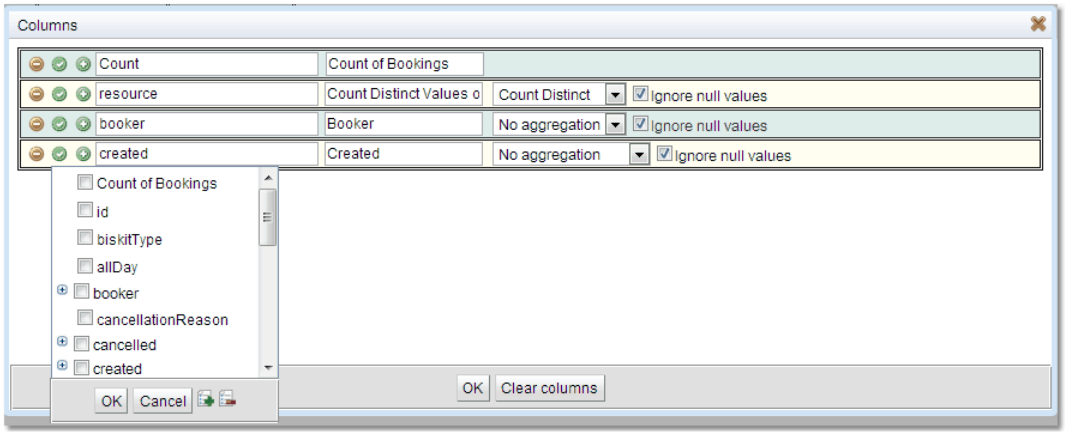
### 2.6.1.4 Group Report

Shows the report as a table with one column showing a **Count of Biskit Type**. The table can then be extended to show other columns for *properties*[252] available within the *Biskit Type*[250] chosen.

To choose more columns either use the **Columns...** button on the toolbar or the **green +** (to add one column), **red -** (to delete the current column), **green tick** (to add multiple columns, tick all columns that are required and then click **OK**, or use the **green +** icon on the menu bar to select all the columns or the **red -** icon to deselect all the options).




If the **Columns...** button is clicked a pop up appears, in which the columns can be chosen using the same three buttons as described above. At the same time the user can decide what aggregation to use, **No aggregation** or **Count Distinct**, as well as whether to **Ignore null values**.

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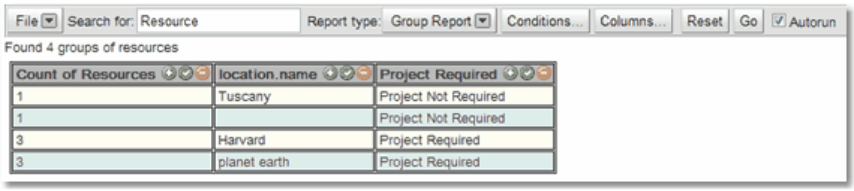
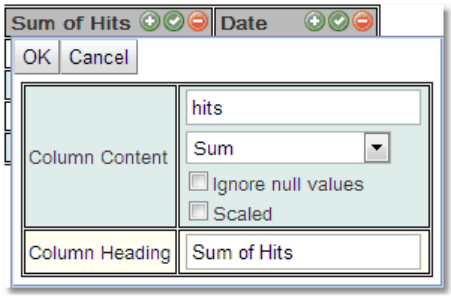
Once the columns have been chosen the table will redisplay using the appropriate number of rows to display the records, grouping records by the columns chosen giving a count in the first column.




Once the columns are displayed, move the cursor over the name of a column and a pop up will appear with **Change** in it. Click on **Change** in order to change

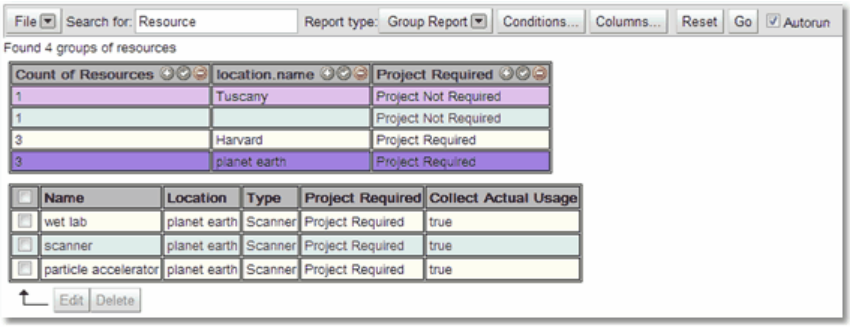
1. The column header
2. The column content




The column content can be changed to

1. Another *property*.
2. A complex content type, see Complex Content Type[32] in the Summary Report[31] section for more details on the types available.
3. Whether null values are ignored.
4. Whether the result should be scaled see Complex Content Type[32] in the Summary Report[31] section for more details on scaling.

Clicking on a cell will produce a *List Report*[251] of the records associated with that cell below the table.




As with the *List Report*[28] clicking on an individual record will give an expanded view of that record below the list.

If the user has the correct *permissions*[251] they may edit the individual records or make changes to multiple records. All of this will be covered in the chapter on Editing Search Information[36]

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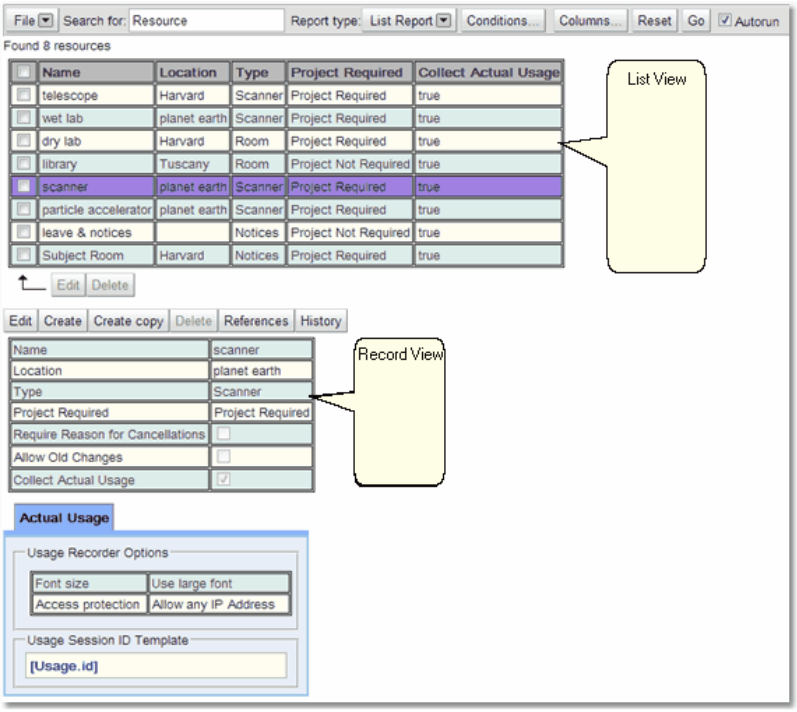
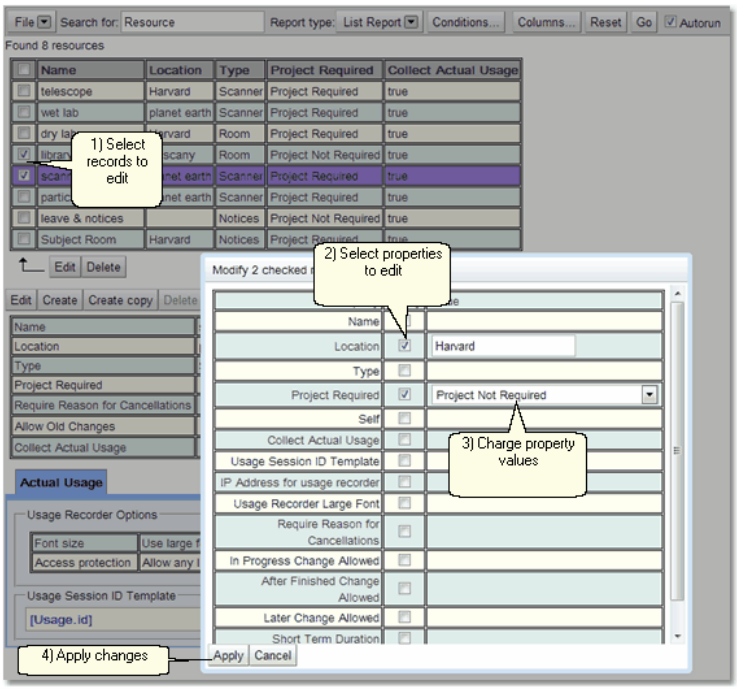
### 2.6.1.5 Editing Search Information

Once the search information is in either a *List Report* [251] view or as an individual record the information can be edited if the user has the *permissions* [251] to do so. The administrator will have set up the *permissions* for your **Exprodo DB**.

For a complete description of the standard toolbar buttons read the Toolbar Button Standard Definition [15] chapter.




For a more complete explanation on how to edit records in the list view read the How to Edit Multiple Items At Once [47] section of the Data Explorer [46] chapter.

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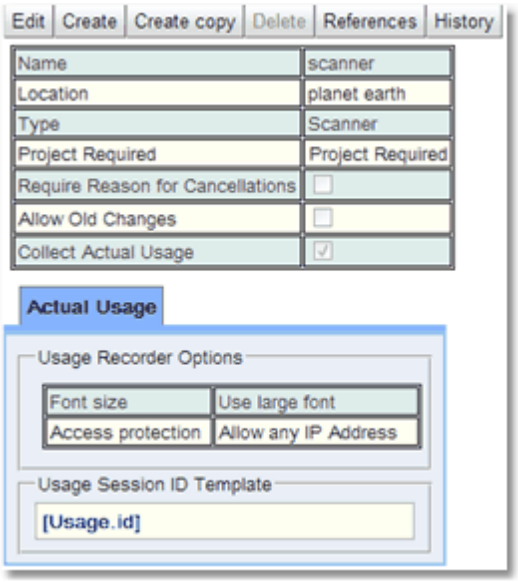
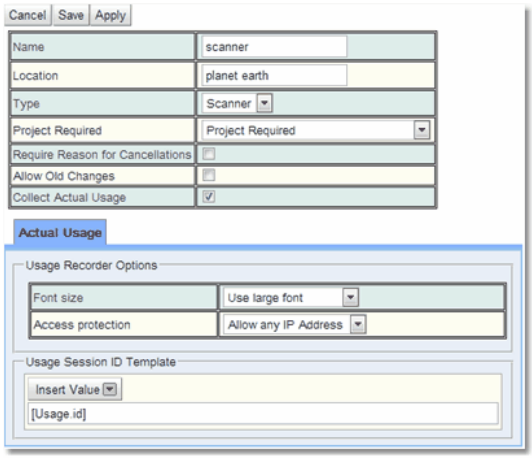
For a more complete explanation on how to edit records in the record view read the How to Edit A Single Item 49 section of the Data Explorer 46 chapter.




Once in edit mode the changes can be made.

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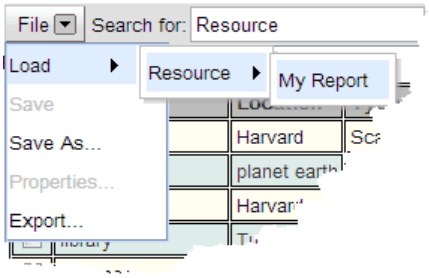
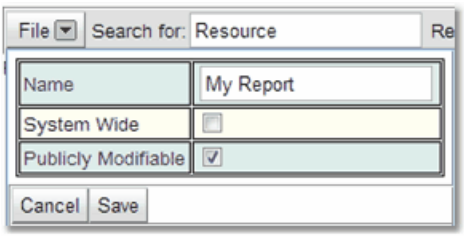
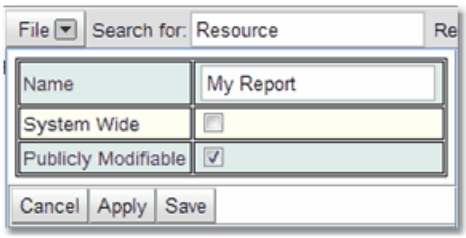
### 2.6.1.6 Saving And Reusing Searches

Once a search has been created that is useful the user may wish to save it for later use. This can be done using the drop down button from the **File** option on the toolbar and choosing **Save As**. This will save the search as a report accessible from the **Search->Reports** 40 page. Using the **File** option the user can also load saved searches to run them, edit the *properties* 252 of any saved searches and export search information to a file called **report.csv**.




When a search has been created use the **File->Save As** to save the search. Give it a **Name**, decide whether the search is accessible to all users (**System Wide**) and whether anyone can edit the search (**Publicly Modifiable**). Then save the search.




When a search is saved it can be reloaded using **File->Load**. If a search is loaded then the *properties* can be edited using the **File->Properties** menu option. When edited they can be saved. In this case **Save** and **Apply** do the same thing, that is save the changed information and leave edit mode.

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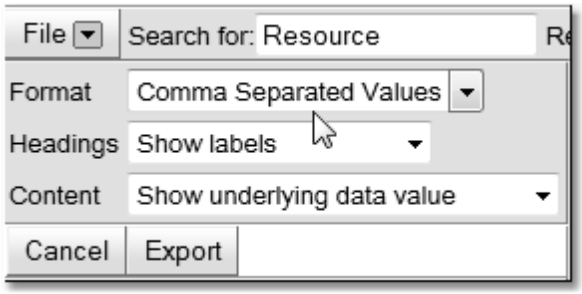
## Exporting Search Information

A user can export any data they have found through a search to a .csv, a tab separated file or native **Excel** file (either pre 2007 xls or post 2007 xlsx) which can then be loaded into such applications as **Excel**.

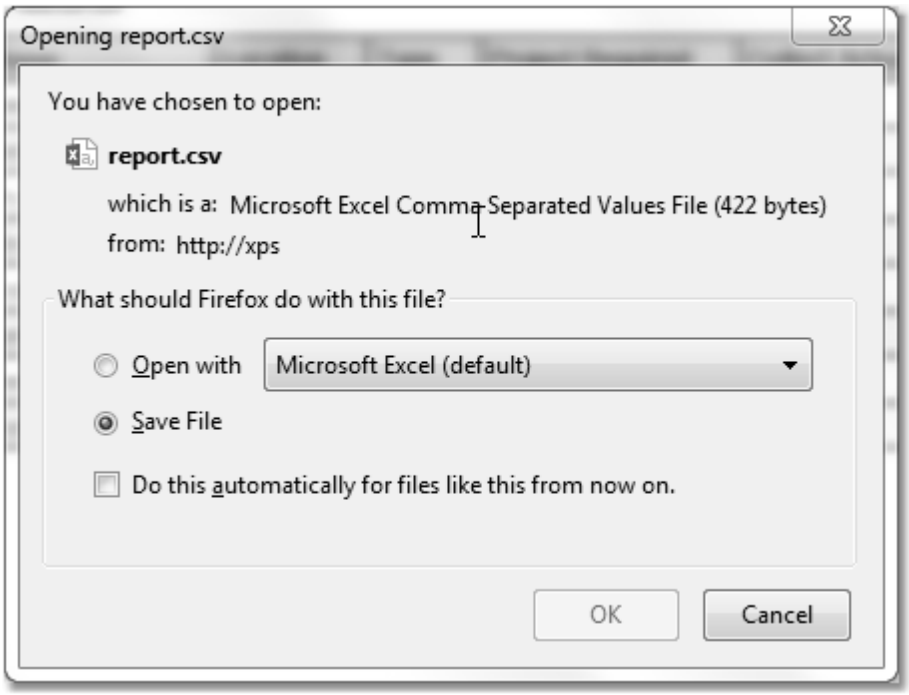
Using **File->Export** the current search data will be exported to a file.

There are three options:

1. How the file will be formatted, choose between **Comma Separated Values, Excel xls**, **Excel xlsx** and **Tab Separated Values.**
2. What headings will be used, these can be **Show labels** or **Show property names**. Labels are those names that have been assigned by the administrator to a *Biskit Type* 250, the *property* name is the name of the *property* in the database.
3. Whether enumerated types have their names shown, **Show value labels** where defined or the value as stored in the database, Show underlying data value.




When the format for the export is chosen press **Export**, then choose whether to open the exported information directly into another application, or whether to save the file. If the file is saved it will be called **report.csv** and found in the users **Downloads** folder.

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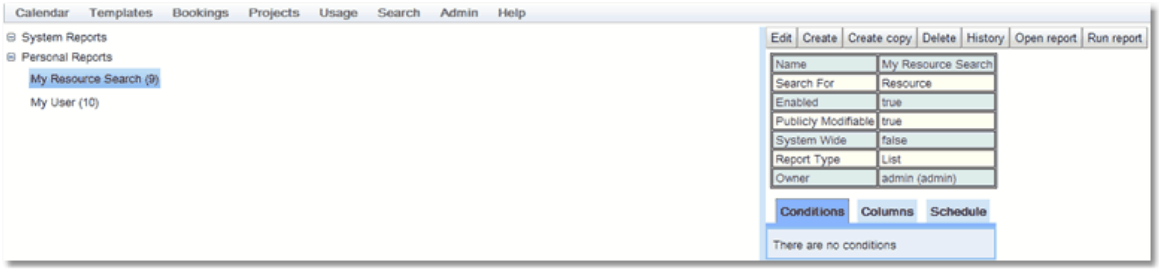
### 2.6.2 Report Manager

The **Report Manager** page allows the management of reports within **Exprodo DB**. By default, it appears under the **Search** menu, with a sub menu item labelled **Reports**. However, the menu may have been configured so that the **Reports** page is not visible by the administrator.

Once useful searches have been created they can be saved for future use as reports (see Saving and Reusing Searches 38). The reports page allows you to view, manage and schedule your reports as well as creating new ones.

The page is split into two. On the left is a list of the **System Reports** (those that anyone can see) and the users **Personal Reports**. On the right is the area where to edit, schedule and create reports, when the user enters the **Reports** page this area is initially empty. Select a report in the left hand pane to see the properties 252 of that report in the right hand pane. Where the page splits can be moved to change the space available for each of the sides.




A report has a number of basic properties:

| Property | Description |
|---|---|
| Name | The name of the report as assigned by the user. |
| Search For | The *biskit type* 250 that will be searched for. |
| Enabled | If the report will run if scheduled. |
| Publicly Modifiable | If a system wide report then anyone can modify it. |
| System Wide | Can everyone see the report or is it a personal one. If this is true the report will appear under **System Reports** rather than **Personal Reports**. |
| Report Type | Will the report display as *List* 251, *Summary* 252 or *Group* 251 report |
| Owner | The user who created the report and if **Publicly Modifiable** is false, the only person who can edit a report if it is also **System Wide** |

and tabs to see other properties:

| Tab | Description |
|---|---|
| Conditions | The *conditions* 250 (if any) associated with the report. (see the Setting Search Conditions chapter for more information about *conditions* and how to edit them) |
| Columns | The columns that will be displayed in the report |
| Schedule | Whether the report is scheduled to run and, when it will run, who the report will be e-mailed to and the format of that e-mail. |

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## The Menu Bars

The menu bar has two variations. In **View** mode:

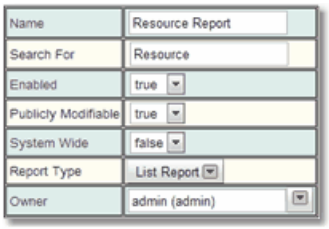
after you press the **Edit** button and enter edit mode:

For a complete description of the standard toolbar buttons read the Toolbar Button Standard Definition 15 chapter.

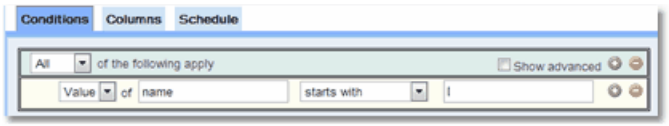
| Report Menu Bar | Description |
|---|---|
| Open Report | Opens the **Search** page in a state ready to run your report. Click **Go** to run the report. This will be greyed out in edit mode |
| Run report | Opens the **Search** page and runs the report. This will be greyed out in edit mode |

## Editing Reports

Once a report is in edit mode the basic *properties* can be changed in the top section, all have drop down menus for the options available other than the report name which can be overwritten.




Use the tabs to add or change the *conditions* (see the Setting Search Conditions chapter for more information about *conditions* and how to edit them).

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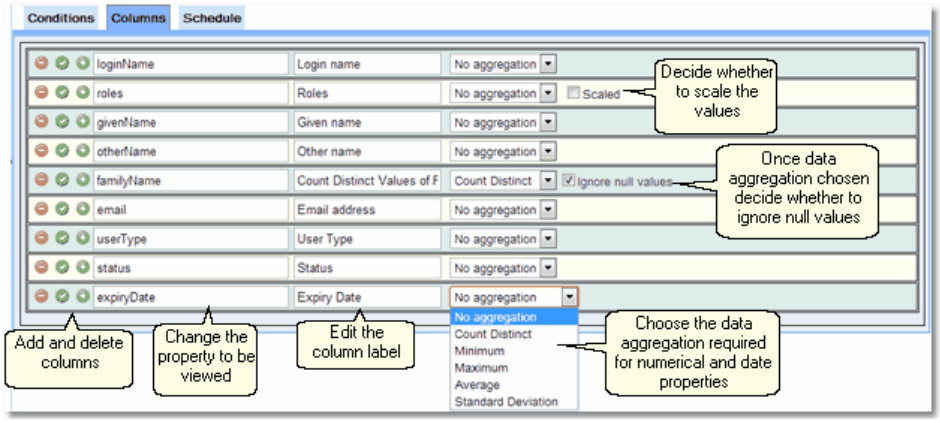
Use the tabs to change the columns that are viewed, what is viewed in them and how they are labelled.




The first column allows the user to add or delete columns from the report, the **green +** (to add one column), **green tick** (to add multiple columns, tick all columns required to be added then click **OK**), **red -** (to delete the current column). (see the Group Report[34] chapter for more information on how they work)

The second column allows the user to change the *properties* that will be viewed in a column.

The third column allows the user to change the label at the top of the column in the report.

The fourth column allows the user to decide whether absolute values or data aggregation is required. See Summary Report[31] chapter, Complex Content Types[32] section for more information. If aggregation of the data has been chosen, then decide whether to ignore null (empty or 0) values.

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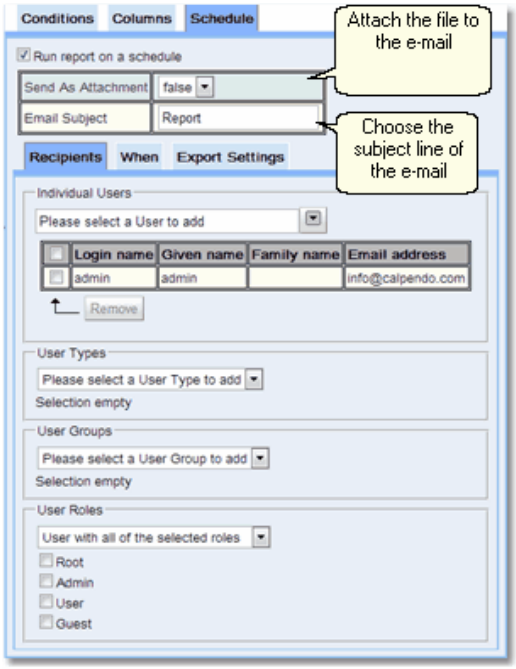
## Scheduling Reports

If box marked **Run report on a schedule** is ticked, options allowing for the setting up of the scheduling of the report appear.




Choose whether to attach the report as a file to the email or whether the body of the email is the report data.

Choose the subject line to appear on the email.

Select the **Recipients** tab to decide who to send the email to.

Select the individual users the mail is to go to.

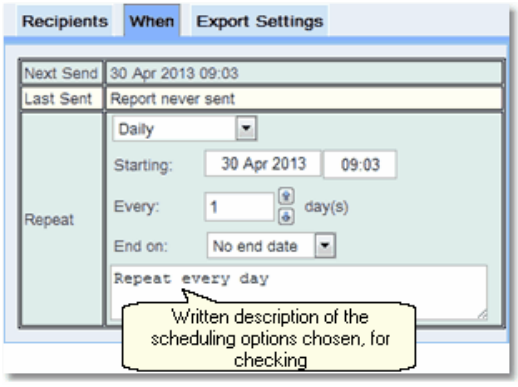
Select the *User Types* 253 the mail is to go to. The mail will be sent to all users of these types.

Select the *User Groups* 252 the mail is to go to. The mail will be sent to all users in these groups.

Select the *User Roles* 253 the mail is to go to. The mail will be sent to all users with these roles.

Emails will only be sent to an address once. So if multiple users have the same email address or with your selections of **Individual,** *Type*, *Group* or *Role* you would have accessed a user multiple times, they will only get one email.

Select the **When** tab to schedule the report.




**Next Send**: The time and date the mail will next be sent with the current settings.

**Last Sent**: The time and date the report was last sent.

Select the frequency of the mail: Daily, Weekly, Monthly by Date, Monthly by Day, Yearly

Select when the emails will start

Specify the frequency: every other day, every third week etc.

Select when the emails will end if required.

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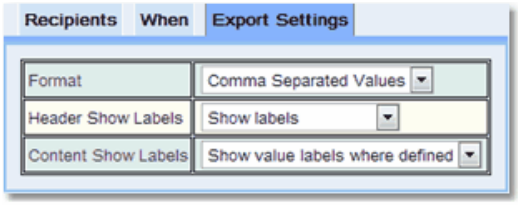
Select the **Export Settings** tab to set up the format of the exported file.




1. **Format**: How the file will be formatted, choose between **Comma Separated Values, Excel xls**, **Excel xlsx** and **Tab Separated Values.**

1. **Header**: What headings will be used, these can be **Show labels** or **Show property names**. Labels are those names that have been assigned by the administrator to a *biskit type*, the property name is the name of the *property* in the database.
2. **Content**: Whether enumerated types have their names shown, **Show value labels where defined** or the value as stored in the database, **Show underlying data value**.

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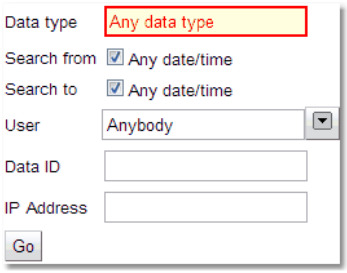
### 2.6.3 History

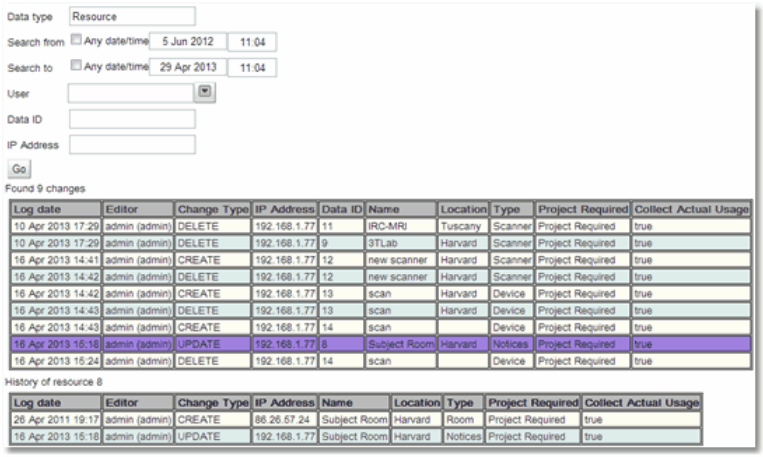
The **History** page allows the user to look into the audit log kept by **Exprodo DB** that shows what has been changed, when and by whom. This page is normally found on the **Search** menu as **Search-->History**. However, the menu may have been configured so that the **History** page is not visible.

To use the page, first enter the search criteria, and then press the **Go** button to see what matching changes can be found. The search criteria can be:

- **Data type**, choose what type of *Biskit*[250] has been changed. For example, if the user is interested in changes to *bookings*[250], then select **Booking**. If a *Biskit Type*[250] is not selected, then the search will include changes made to any type of *Biskit*.
- **Search from** and **Search to**, to restrict the search to particular periods of time. It is highly recommended to put limits on the time period using these options so that the amount of returned results are limited.
- **User**, choose to see changes made only by one particular user, or by anybody.
- **Data ID**, choose the unique ID number to search for. For example, if the user is interested in a *project*[251], and they know its ID is 42, then enter 42 here to restrict results to changes made to project 42.
- **IP Address**, search by changes made from a particular internet address.




After pressing **Go**, a list of matching changes is displayed. Each one will represent a change to something within **Exprodo DB**. When the list appears, click on one of them to see all changes to the same *Biskit*. For example, if the search was for changes to *resources*[252] made on a particular day, returned will be a list of changes that affected all the *resources* on that day. By clicking on one of them, the user would then see all changes made to that *resource*, regardless of when that change was made.


Data type
Resource
Search from
Any date/time
5 Jun 2012
11:04
Search to
Any date/time
29 Apr 2013
11:04
User
Data ID
IP Address
Go
Found 9 changes
Log date
Editor
Change Type
IP Address
Data ID
Name
Location
Type
Project Required
Collect Actual Usage
10 Apr 2013 17:29 admin (admin) DELETE 192.168.1.77 11 IRC-MRI Tuscany Scanner Project Required true
10 Apr 2013 17:29 admin (admin) DELETE 192.168.1.77 9 3TLab Harvard Scanner Project Required true
16 Apr 2013 14:41 admin (admin) CREATE 192.168.1.77 12 new scanner Harvard Scanner Project Required true
16 Apr 2013 14:42 admin (admin) DELETE 192.168.1.77 12 new scanner Harvard Scanner Project Required true
16 Apr 2013 14:42 admin (admin) CREATE 192.168.1.77 13 scan Harvard Device Project Required true
16 Apr 2013 14:43 admin (admin) DELETE 192.168.1.77 13 scan Harvard Device Project Required true
16 Apr 2013 14:43 admin (admin) CREATE 192.168.1.77 14 scan Device Project Required true
16 Apr 2013 15:18 admin (admin) UPDATE 192.168.1.77 8 Subject Room Harvard Notices Project Required true
16 Apr 2013 15:24 admin (admin) DELETE 192.168.1.77 14 scan Device Project Required true
History of resource 8
Log date
Editor
Change Type
IP Address
Name
Location
Type
Project Required
Collect Actual Usage
26 Apr 2011 19:17 admin (admin) CREATE 86.26.67.24 Subject Room Harvard Room Project Required true
16 Apr 2013 15:18 admin (admin) UPDATE 192.168.1.77 Subject Room Harvard Notices Project Required true

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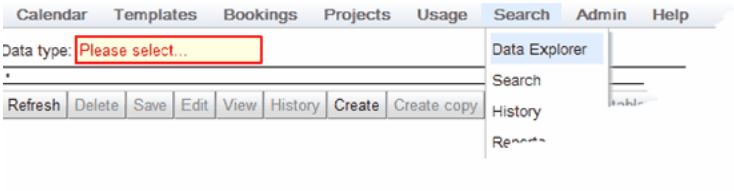
### 2.6.4 Data Explorer

The **Data Explorer** page allows examination of the data within **Exprodo DB**. By default, it appears on the menu here:

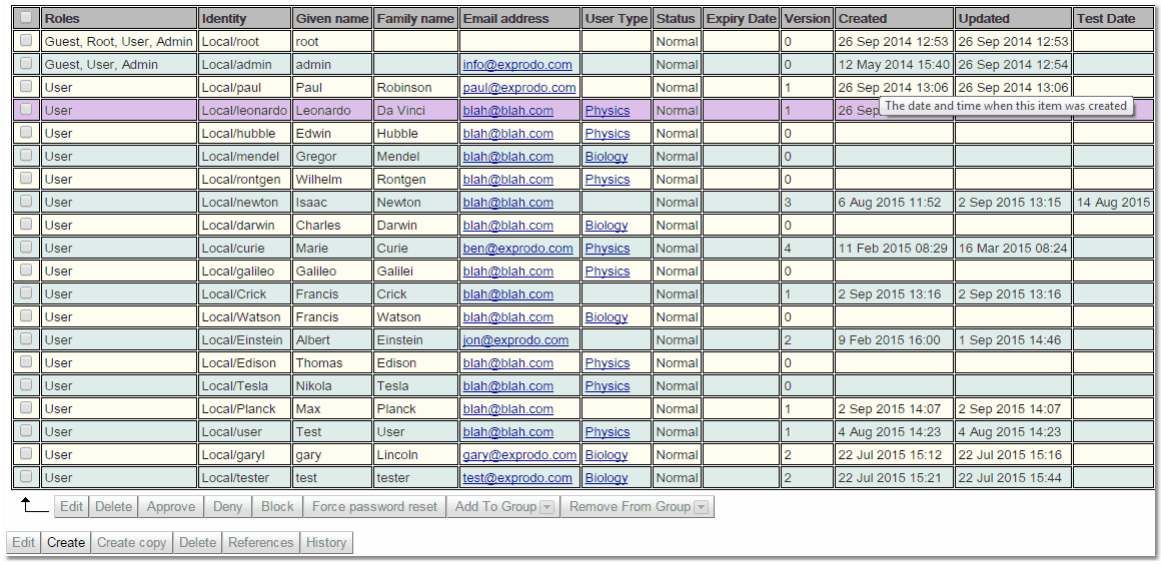



Select a *Biskit Type*[250], and a table appears that shows all *Biskits*[250] of that type.

> Note: The **Data Explorer** page does not yet handle well the situation when there is lots of *Biskits* of the selected type. It is highly recommended that the user does not attempt to use the **Data Explorer** to view *Bookings*[250], for example, since there may be many of them.

Apart from being able to choose the type of data to look at, the **Data Explorer** page is identical to several other pages in **Exprodo DB**, such as the list of users shown in Modifying Users.

Select **User** as the *Biskit Type*, then a list of users will appear and the user will be able to examine or modify them (*permissions*[97] permitting).

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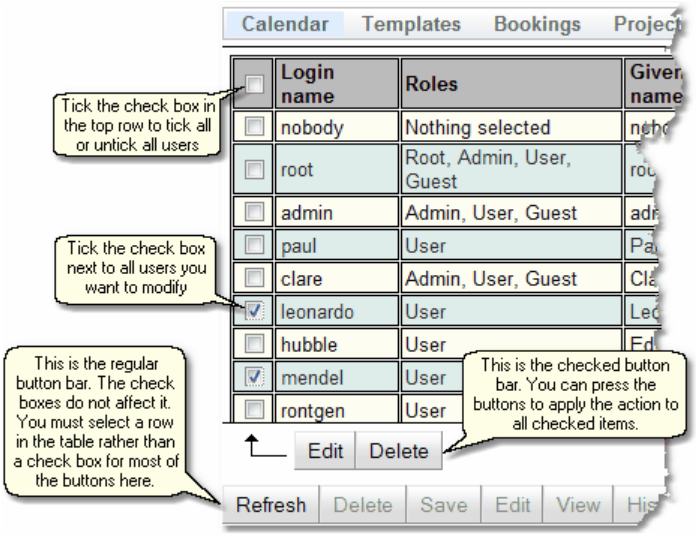
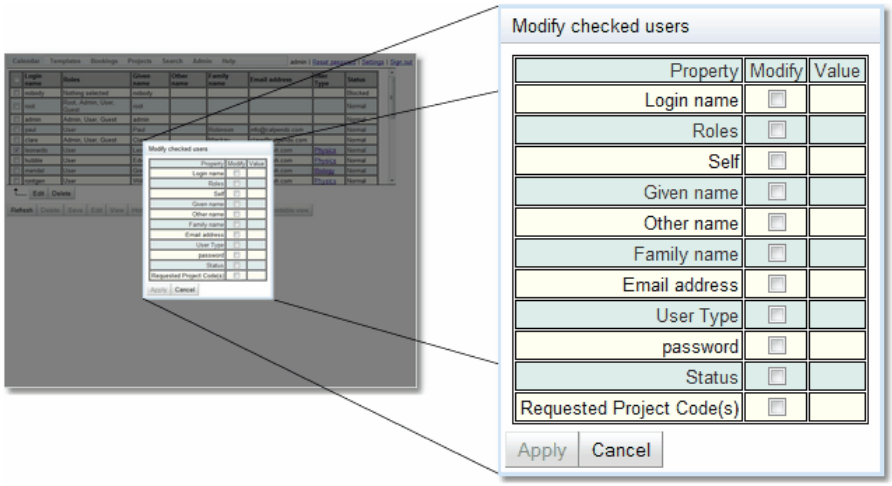
## How To Edit Multiple Items At Once

You can edit many items in one go quite easily, using the check boxes and the checked button bar as follows:

1. Tick the check boxes next to each item to be changed, or tick the box in the header row to tick all boxes.
2. 

3. Once one or more check boxes have been ticked, the checked button bar will change so it is no longer greyed out. Press the **Edit** button to edit all the ticked items.
4. When you press the **Edit** button, a pop-up appears showing most of the *properties*[252] that are defined for the selected *Biskit Type*. However, some may be missing if they are too complex to edit in this pop-up (for example, *properties* that contain lists of things). If these properties are **Grouped** or have a **Layout** defined then the pop up will be hierarchical.

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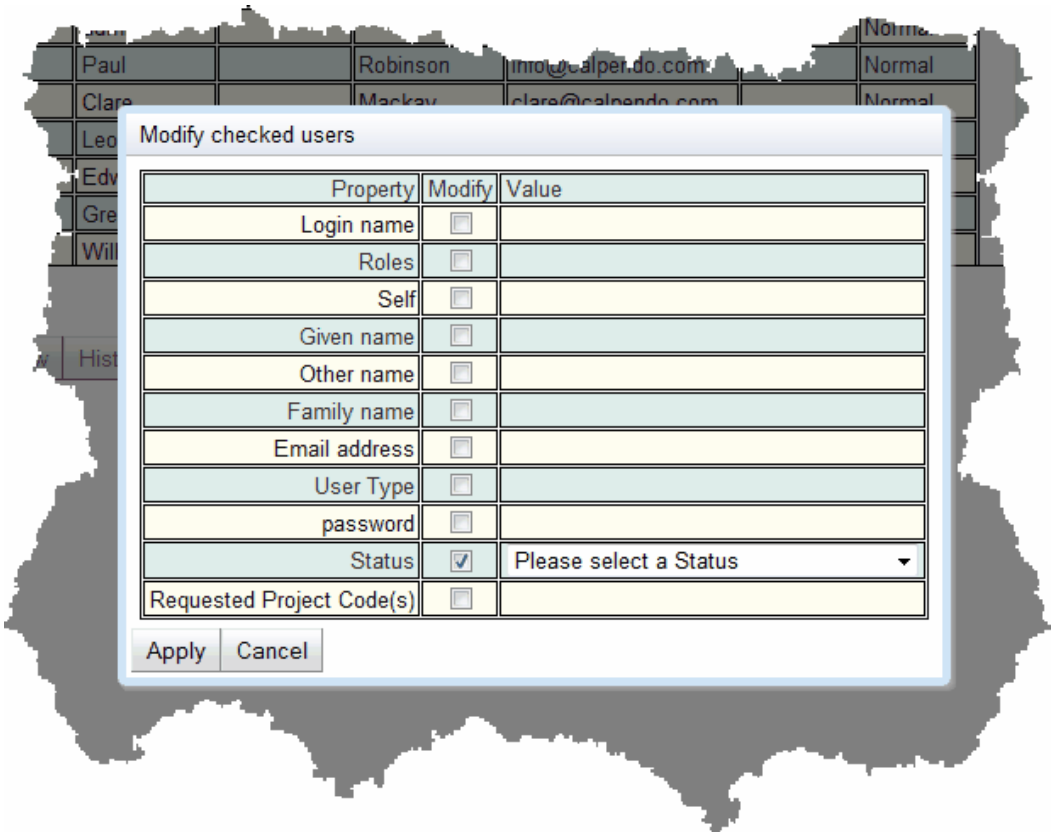
5. Tick the check boxes of one or more *properties* shown in the pop-up. Once done, the **Apply** button changes so it is no longer greyed out, and an editor appears in the **Value** column:




6. Choose a value for each *property* whose check box you tick. When finished, press the **Apply** button. Every ticked item will then be modified, with only the ticked *properties* being changed. Whatever values selected for each *property* will be applied to all the ticked items. *Properties* that are not ticked are not affected by the change.

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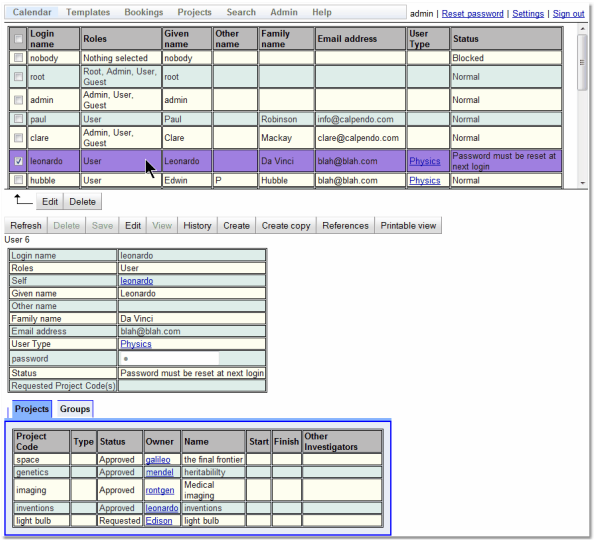
## How To Edit A Single Item

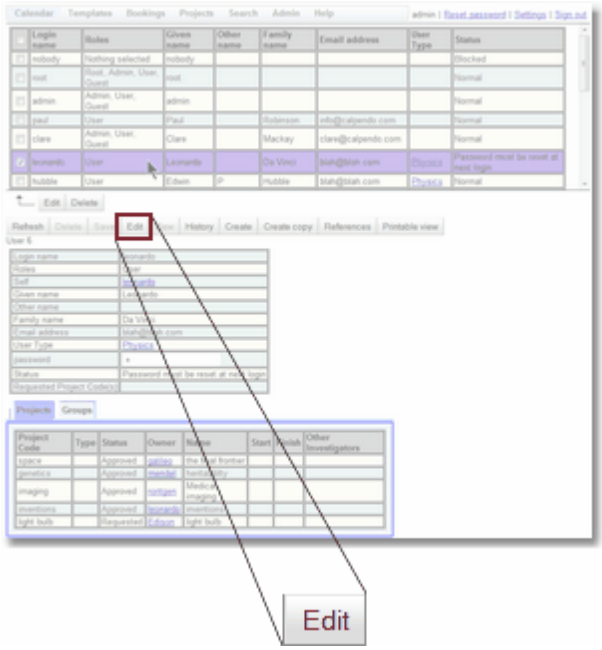
While it is very useful being able to edit multiple items at once, the above mechanism doesn't let you edit every *property*. If the user wants to change the more complex *properties*, such as lists of things, then they need to use a different change mechanism.

For a complete description of the standard toolbar buttons read the Toolbar Button Standard Definition 15 chapter.

1. Click anywhere in the row for the item to edit, apart from its check box in the first column. The item's details are shown below the list of items.


Calendar Templates Bookings Projects Search Admin Help
admin | Reset password | Settings | Sign out
Edit Delete
Refresh Delete Save Edit View History Create Create copy References Printable view
User 6
Projects Groups

2. Press the **Edit** button (not the one in the checked button bar)

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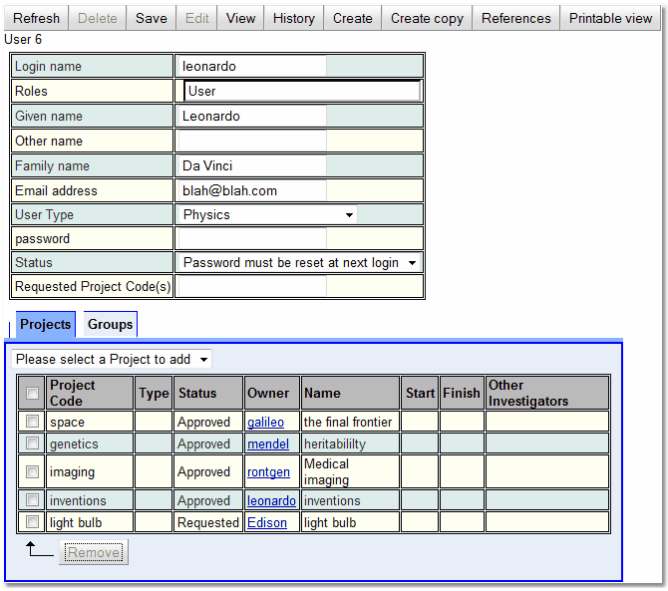
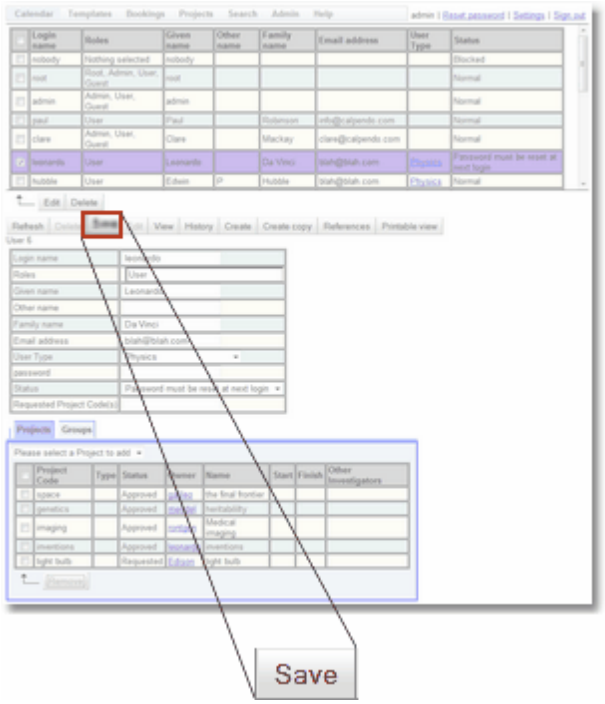
3. The item is now shown with the *properties* editable. Note that, depending on how *permissions*[251] have been set up, it is possible that some *properties* will still show as read-only.




4. Once changing *properties* has been completed, press the **Save** button. The item is then saved and shown read-only again.

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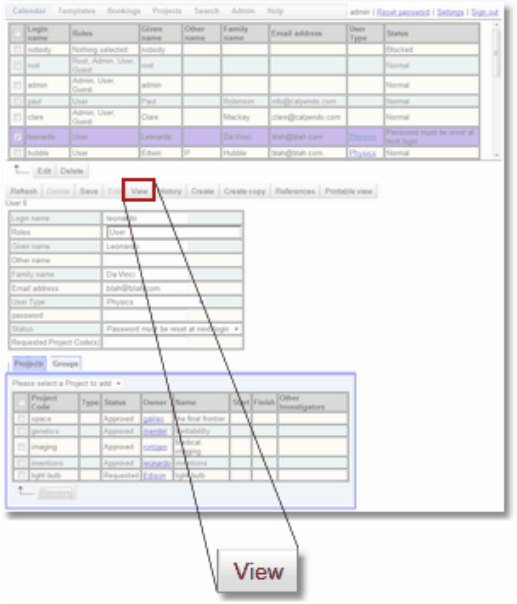
5. To cancel the edit while an item is shown in an editable format, either click on the row for a different item or press the **View** button.




### Configuring The Properties Displayed

The user can control which *properties* are displayed in the list of items, in the detailed view of a item. This is done in the Bakery[173].

- Properties Visible In A Biskit List[183] explains how to change the *properties* that are displayed in a list of items. Change the visibility of each of the *properties* defined on an item.
- Properties Visible In Biskit Detail[183] explains how to change the *properties* that are displayed when seeing a detailed view of an item. In this case, it affects both the read-only and editable mode detailed view of an item. Again, change the visibility of each of the *properties* defined on an item.
- Properties Visible In A Collection Editor[183] explains how to change the *properties* that are displayed in collection editors. For example, if there is a *Project*[251] *Biskit Type* that contains a list of **Users**, then the user can change which *properties* are shown to represent those users in the *Project's* list of users.

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## 2.7 Web Browser Compatability

**Exprodo DB** supports the most popular web browsers: Firefox, Safari, Google Chrome and Opera. Internet Explorer is also supported from version 7, but is much slower than the other browsers. Internet Explorer version 6 will mostly work, but will be extremely slow and some behaviour will be incorrect. The users experience with **Exprodo DB** will be much better if Internet Explorer versions 6 and 7 are avoided, and preferably if Internet Explorer version 8 is avoided as well.

If the user has no choice but to use Internet Explorer versions 6 or 7, then it will help if to install Google ChromeFrame. This is a plug-in for Internet Explorer that allows some web pages to use Google Chrome to render pages.

| Name | Version | Comments |
|---|---|---|
| Google Chrome | All | Supported |
| Firefox | 3.0 and later | Supported |
| Apple Safari | 4, 5, 6 | Supported |
| Opera | 9, 10, 11 | Supported |
| Internet Explorer | 6 | Not supported. Very slow and doesn't always behave properly. |
| | 7 | Supported, but very slow. Use another browser if possible. |
| | 8 | Supported, but slower than any of the other major browsers. |
| | 9 | Supported, but slightly slower than other major browsers. |
| | 10 | Supported |

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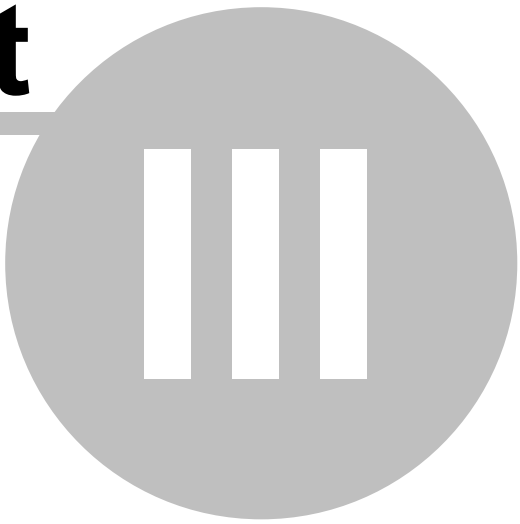
# Part



# 3 Exprodo DB Administration Guide

The **Exprodo DB Administration Guide** covers the day-to-day administration that is required for an **Exprodo DB** installation. This guide should be read in conjunction with the **Exprodo DB User Guide** 10.

## 3.1 User Administration

When somebody first registers with **Exprodo DB** (as described by Getting A User Account 10), a new user is created with a status of **Requested**. While a user has this status, they are unable to log in. An administrator must then approve the user by changing their status to **Approved**. This and other user-related administration is described in this section.

### 3.1.1 User Properties

This chapter describes the properties of a user and what they are for, but not how to change them. See Modifying Users 67 for a description of how to change the *properties* 252 on a user. The licence for **Exprodo DB** counts the users with status **Normal** (whose accounts have not expired) and **Password must be reset at next login**.

#### Identity

Every user has a combination of authentication method and login name which must be unique. The login name may contain letters, numbers, hyphen, underscore or full stop. A login name may be changed as long as the new name adheres to these constraints.

#### Roles

There can be up to 32 *roles* 253 defined in the system, including the predefined and special **Root** and **Admin** *roles*. A user with the **Root** role always has *permission* to do anything in the system. A user with the **Admin** role is allowed to perform administrative tasks. However, **Exprodo DB** can be configured so that the **Admin** role is not required for administrative tasks. The remaining 30 possible roles can be configured as required, and they are normally associated with setting up *Permissions* as required for your facility. See User Roles 190 in the Bakery 173 section of the **Exprodo DB Configuration Guide** for how add new *roles*.

Users with the **Root** role have the following special properties:

- *Permissions* are not checked. *Permission* is always granted.
- They are allowed to log in, even while the licence has expired. This allows you to recover such situations once you have a new licence.
- They can change the *status* 253 of a user to make them active (for example, by changing the status from **Blocked** to **Normal**), even if it means there will be more active users than the licence allows. However, this may not be a good thing to do since only **Root** would then be able to use the system.
- Normally, a user can only allocate other users with roles that they already have. However, if a user has the **Root** role, they can add any role to another user.

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Users with the **Admin** role have the following special properties:

- By default, *Permissions* are created that allow a user with the **Admin** role to **create**, **update** and **delete** almost all *Biskit Types*[250]. They can also update the database schema when using the Bakery[173]. However, these *Permissions* are changeable and may be added, removed or modified for any user by a user with **Admin** privileges.
- When the **Exprodo DB** licence has fewer than 30 days remaining, users with the **Admin** role will receive a warning each time they log in. Regular users only receive a warning in the 7 days prior to expiration. Note that 30 days' grace period is allowed, so that there is always time after expiration before the licence must be renewed.
- When a user with the **Admin** role logs in for the very first time, they are assigned the menu that has been configured for **Admin** users in Global Preferences -> Menus -> Default Admin Menu[150]. A user that has neither the **Root** nor the **Admin** role will be assigned the menu specified in Menus -> Default User Menu[150] when they first log in.

The final difference that users with the **Root** or **Admin** role may notice is that each *Biskit Type* can be configured in the Bakery[173] to be visible to users with the **Root** role, users with the **Admin** role, everybody or nobody. For example this provides a way to reduce the number of *bisikit types* that users may search for, for example.

## Names And Email

A user's name is split into three parts: their given name (usually their first name), the family name (usually their last name) and their other name (for any middle names). **Exprodo DB** uses these names for display and in reports, but not for anything else. For example, it is not a requirement that a user's name is unique.

A user's email address is important because **Exprodo DB** sends emails for various reasons (Automatic Emails[116] and Manual Emails[71]).

## Type

**Exprodo DB** may be configured so that users are asked for a *type*[253] when they first register. The *type* is a means of segregating users into non-overlapping sets, which may be used by the facility for assigning *Permissions*[251]. The possible values for a *user type* are configured in Configuring Types And Groups[94].

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## Password

The users password is stored here, but will only be shown as a number of dots for security reasons. If there is no password the box will be empty.

## Status

A *user's status* 253 indicates whether they can log in. It can take the following values:

| Status | Description |
|---|---|
| **Requested** | This is the status given to a user when they first register. A user whose status is **Requested** cannot log in. |
| **Normal** | This is the normal status for a user who can log in. |
| **Password must be reset at next login** | A user whose status is **Password must be reset at next login** can log in, but they will be forced to change their password as soon as they do so. If an administrator needs to reset a user's password, then it's useful also to set their status to this value at the same time. |
| **Blocked** | A user whose status is **Blocked** cannot log in. Typically, use this status for a user that needs to be stopped from logging in for some reason. |
| **Denied** | A user whose status is **Denied** cannot log in. Typically, use this status when not approving a new user request, although there is also have the option of deleting the user. |
| **Expired** | A user whose status is **Expired** cannot log in. Either their expiry date has passed or the administrator has decided they no longer need to use the system. |
| **Lurker** | A user whose status is Lurker cannot login but will receive automatic and booking reminder e-mails. |

The reason that both **Blocked** and **Denied** statuses exist is so that an Automatic Email 116 can be sent to the affected user with a message that is suitable for the situation.

## Expiry Date

This allows the administrator to set an expiry date for the users login. When this field is edited a calendar will appear, just select the day the login is to expire on.

## Last Login and Last Login From

This records the last date and time the user logged in and the IP address of the machine they logged in from.

## Groups

A user may belong to any number of *user groups* 252, and group membership can be used for assigning *Permissions*. The *groups* that exist are configured in Configuring Types And Groups 94.

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### 3.1.2 The User Approval Process

When users first register, their *status* [253] is set to **Requested**. While a *user's status* is **Requested**, they will not be able to log in. Approving new users, and thereby allowing them to log in, simply means changing their *status* to **Normal**. Deny the user request by changing their *status* to **Denied** or delete the user. It is also useful to define the users *roles* [253] at this point. A new user can be assigned any *role* the person doing the assigning has. User approval can be done in the following places:

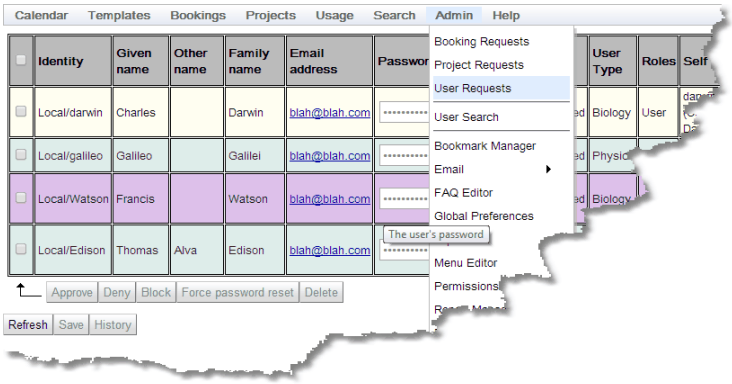
- **The User Requests** [57] page [57] shows just the users whose status is **Requested**. It also provides short-cuts to approving or denying user requests and allows for user detail modification.
- Modifying Users [67] describes how to use the other options for modifying users. That is, the **User Search** page and the Data Explorer [46].

By default, **Exprodo DB** has an Automatic Email configured that will tell all administrators when there is a new user request. The email received contains links to approve or deny the new user request. Just click on the links in the email to approve or deny new users.

Please note that if a *resource* [252] requires a *project* [251] to be entered when a *booking* [250] is made, a user cannot book that *resource* unless they are assigned to the *project* being used to make the *booking*.

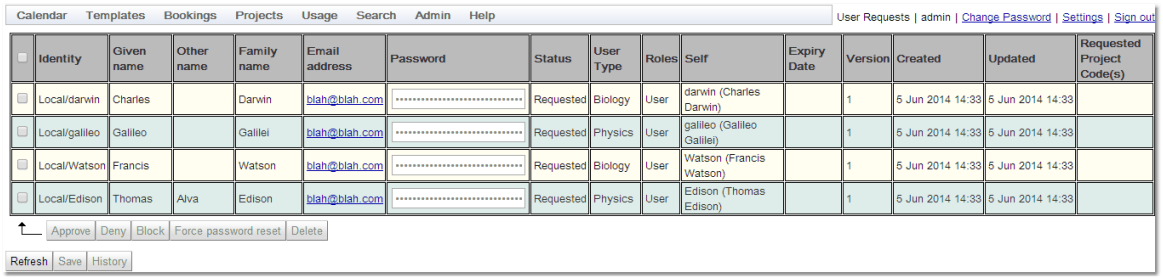
### 3.1.3 The User Requests Page

The **User Requests** page shows users whose status is **Requested**. By default, the **User Requests** page appears on the menu here:




However, your administrator may have configured the menus differently.

This is what the **User Requests** page looks like when some users are awaiting approval:

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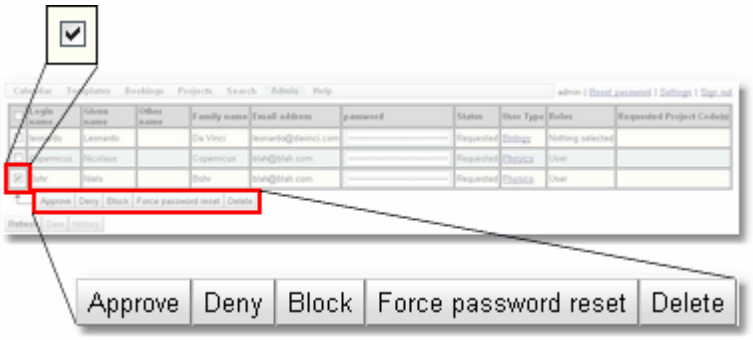
## Approving Or Denying Users

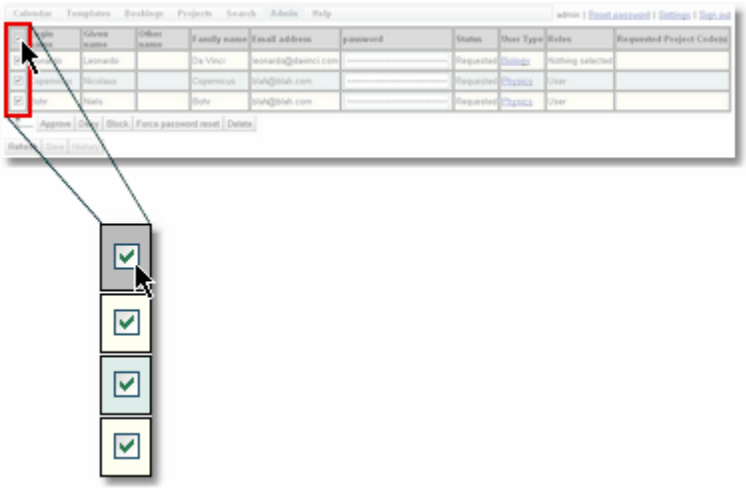
As described in The User Approval Process 57, approving or denying new users means changing their *status* 253. The top part of the **User Requests** page provides a quick way to do just this. Tick the check box next to each user whose *status* to be changed.




Note that as soon as there are any users checked, then the checked button bar changes so that it is no longer greyed out.

Now press any of these buttons to **Approve**, **Deny**, **Block** or **Delete** the ticked users. Press **Force password reset** to allow the users to log in, but force them to change their password.

Alternatively, tick the check box in the table's header and every check box will be ticked (or unticked, as appropriate) as a short-cut to ticking all users.



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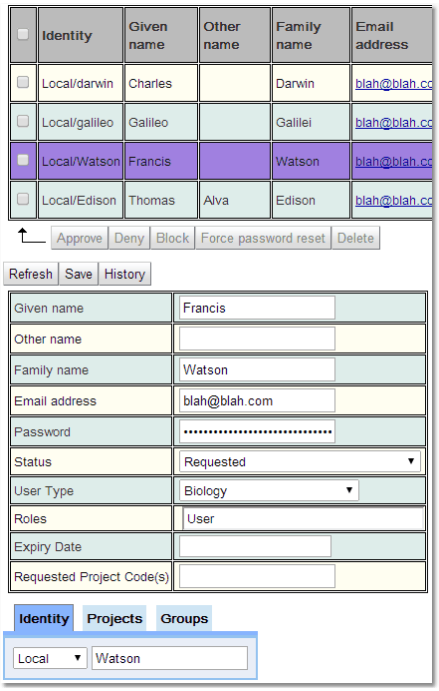
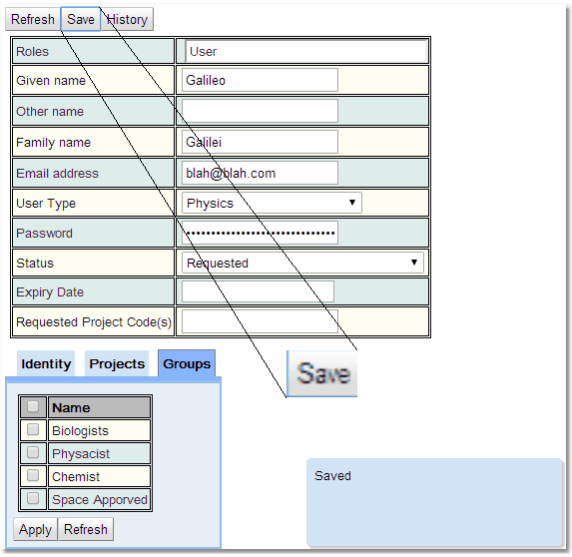
## Changing More Than A User's Status

The **User Requests** page can be used for more than just changing a *user's status*. First, click anywhere in the user's row apart from the check box. The user's details will appear at the bottom of the page already in edit mode, and the values can be changed as required. It is useful to define the *users roles* [253] at this point. A new user can be assigned any *role* the person doing the assigning has. If the assignee has **Admin**, **Guest** then they can assign **Admin** and **Guest** *roles* to another user.




Choose the *status* you want the user to have from the drop-down.

There is no difference between selecting a *status* here and using the buttons in the checked button bar.
When finished, press the ***Save*** button. A pop-up will appear briefly in the bottom right corner to indicate the user was saved.

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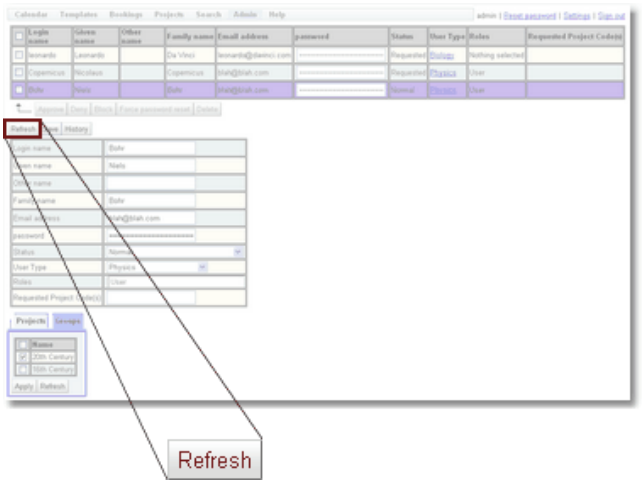
Although we have now changed this *user's status*, it still appears in the table of user requests. However, the *status* shown in the table has changed. A user will remain in the **User Requests** page until the **Refresh** button is pressed, or the browser is refreshed.

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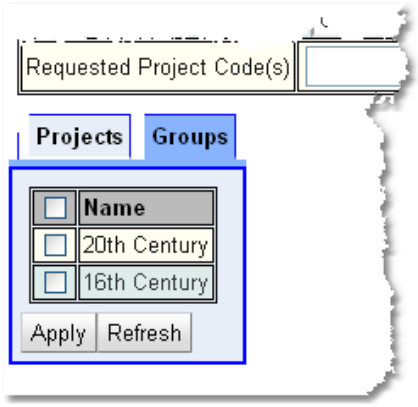
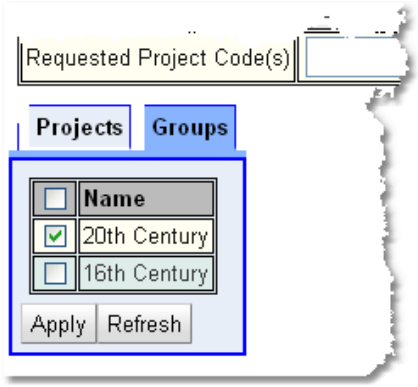
## Changing The User's Group Membership

To associate the user with some *users groups* [252], first select the user's row, as shown above in Changing More Than A User's Status [59], and then click the **Groups** tab.




The check boxes indicate what *groups* this user is a member of. New users will not be a member of any *groups*, so no boxes are checked. Tick the check boxes next to the *groups* this user needs to be a member of.




Once all the required *user groups* are chosen, press the **Apply** button. Once done, a pop-up showing the number of user groups that have been changed will appear.

The user does not need to save the user information if only the *group* memberships have changed. That's because *group* memberships are a *property* [252] of the **User Group** and not the **User**, and it's also why there's a separate **Apply** button to save the *group* membership changes.

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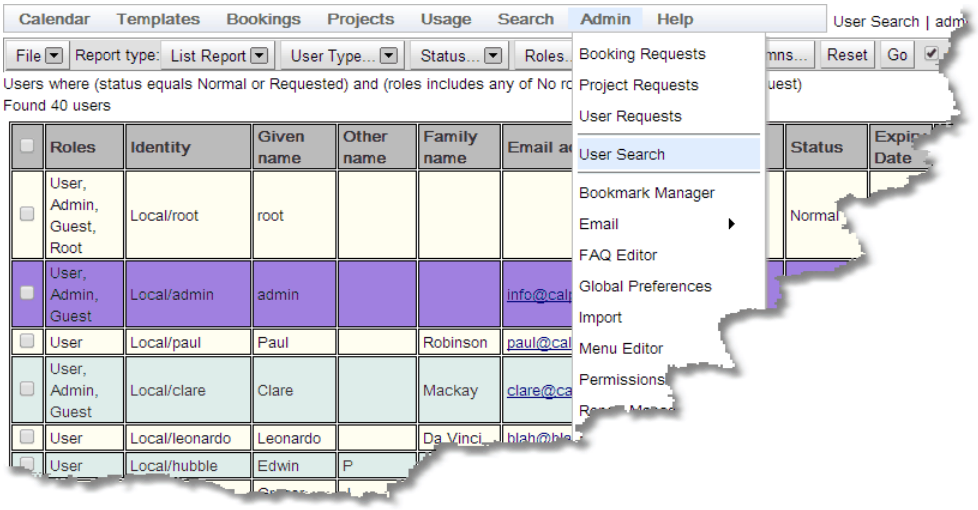
### 3.1.4 User Search

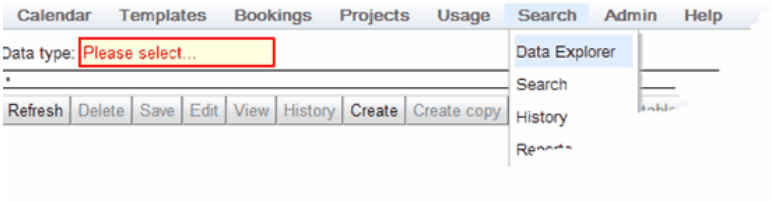
To search for users use the dedicated **User Search** page, which by default appears on the menu here:




The administrator may have configured your **Exprodo DB** so that the menu is different.

The alternative way to get a list of users is by using the Data Explorer[46] and choosing **User** as the *Biskit Type*[250]. It doesn't make any difference which method is chosen - these pages behave almost identically apart from **User Search** being dedicated to users, while Data Explorer[46] can handle any *Biskit Type*.

By default, Data Explorer[46] appears on the menu here:

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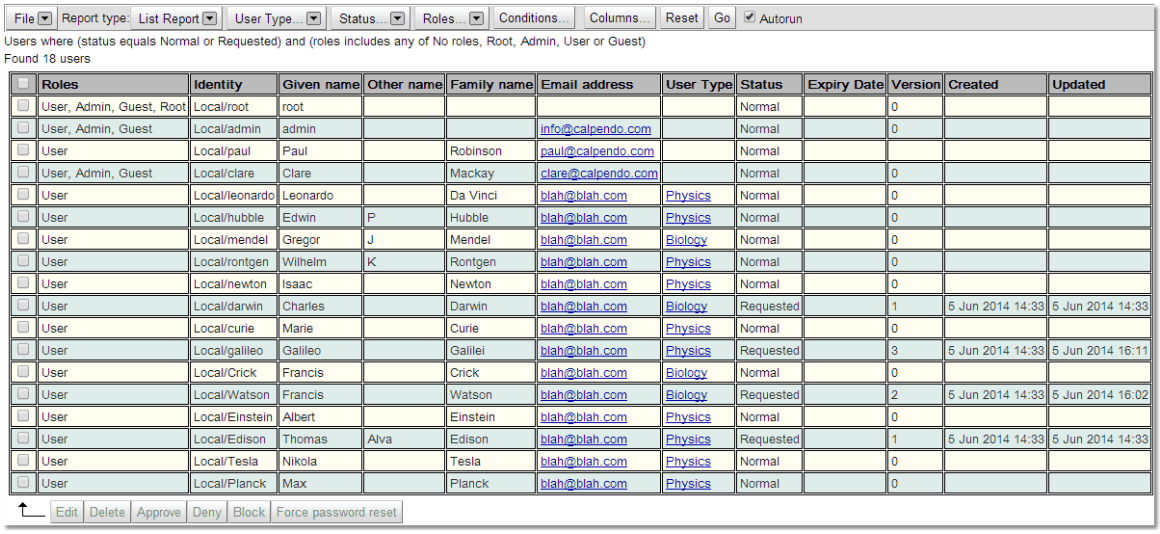
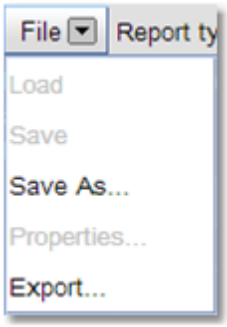
This is what the **User Search** page looks like when it is first displayed:



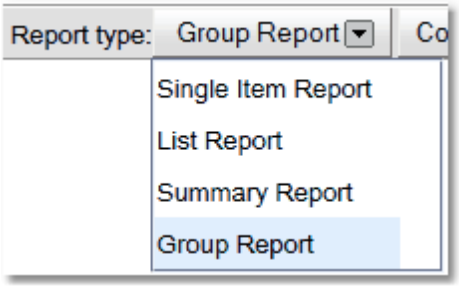

| Roles | Identity | Given name | Other name | Family name | Email address | User Type | Status | Expiry Date | Version | Created | Updated |
|---|---|---|---|---|---|---|---|---|---|---|---|
| User, Admin, Guest, Root | Local/root | root | | | | | Normal | | 0 | | |
| User, Admin, Guest | Local/admin | admin | | | info@calpendo.com | | Normal | | 0 | | |
| User | Local/paul | Paul | | Robinson | paul@calpendo.com | | Normal | | | | |
| User, Admin, Guest | Local/clare | Clare | | Mackay | clare@calpendo.com | | Normal | | 0 | | |
| User | Local/leonardo | Leonardo | | Da Vinci | blah@blah.com | Physics | Normal | | 0 | | |
| User | Local/hubble | Edwin | P | Hubble | blah@blah.com | Physics | Normal | | 0 | | |
| User | Local/mendel | Gregor | J | Mendel | blah@blah.com | Biology | Normal | | 0 | | |
| User | Local/rontgen | Wilhelm | K | Rontgen | blah@blah.com | Physics | Normal | | 0 | | |
| User | Local/newton | Isaac | | Newton | blah@blah.com | Physics | Normal | | 0 | | |
| User | Local/darwin | Charles | | Darwin | blah@blah.com | Biology | Requested | | 1 | 5 Jun 2014 14:33 | 5 Jun 2014 14:33 |
| User | Local/curie | Marie | | Curie | blah@blah.com | Physics | Normal | | 0 | | |
| User | Local/galileo | Galileo | | Galilei | blah@blah.com | Physics | Requested | | 3 | 5 Jun 2014 14:33 | 5 Jun 2014 16:11 |
| User | Local/Crick | Francis | | Crick | blah@blah.com | Biology | Normal | | 0 | | |
| User | Local/Watson | Francis | | Watson | blah@blah.com | Biology | Requested | | 2 | 5 Jun 2014 14:33 | 5 Jun 2014 16:02 |
| User | Local/Einstein | Albert | | Einstein | blah@blah.com | Physics | Normal | | 0 | | |
| User | Local/Edison | Thomas | Alva | Edison | blah@blah.com | Physics | Requested | | 1 | 5 Jun 2014 14:33 | 5 Jun 2014 14:33 |
| User | Local/Tesla | Nikola | | Tesla | blah@blah.com | Physics | Normal | | 0 | | |
| User | Local/Planck | Max | | Planck | blah@blah.com | Physics | Normal | | 0 | | |

The following section goes through the options available after the search has been completed, enabling the search to be changed, saved or the data exported, as well as change the information viewed by the search. For more information on any of the features shown read the Search[27] chapter.




**Save As**: Allows saving of the report for later use.

**Export**: Allows export of the information found in the search to a file.




This button determines what type of report will be seen:

*Single Item Report*[252] Displays a single record that matches the search.

*List Report*[251]: Lists each record found that matches the search one under the other.

*Summary Report*[252]: Allows the information found to be summarised.

*Group Report*[251]: Allows the report to be shown by groupings with a count of the number of records that fit each group.

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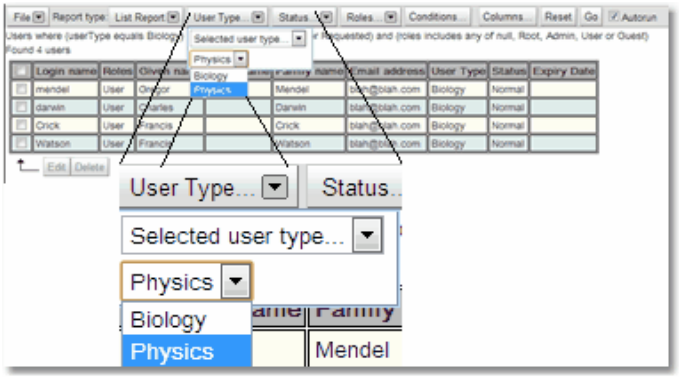
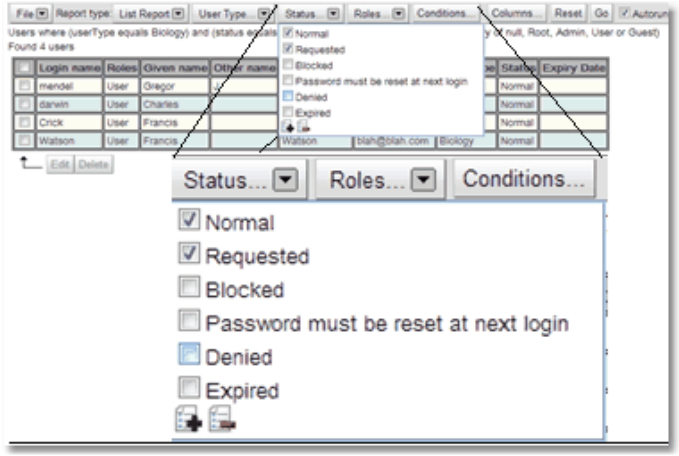
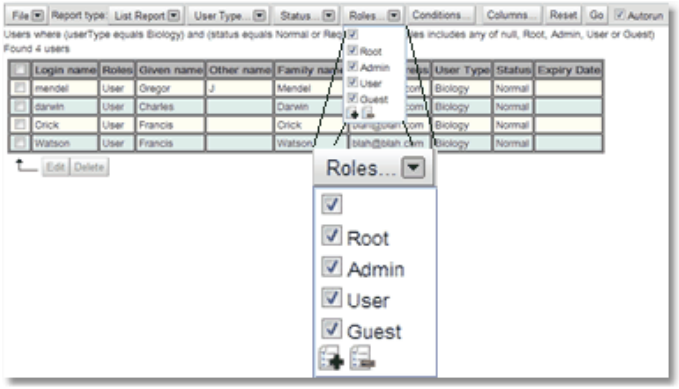
To change the search parameters




Choose **Selected User Type** then select a *user type*[253] from the drop down options.




Then select the *user status*[253] required.




And select the *user roles*[253].

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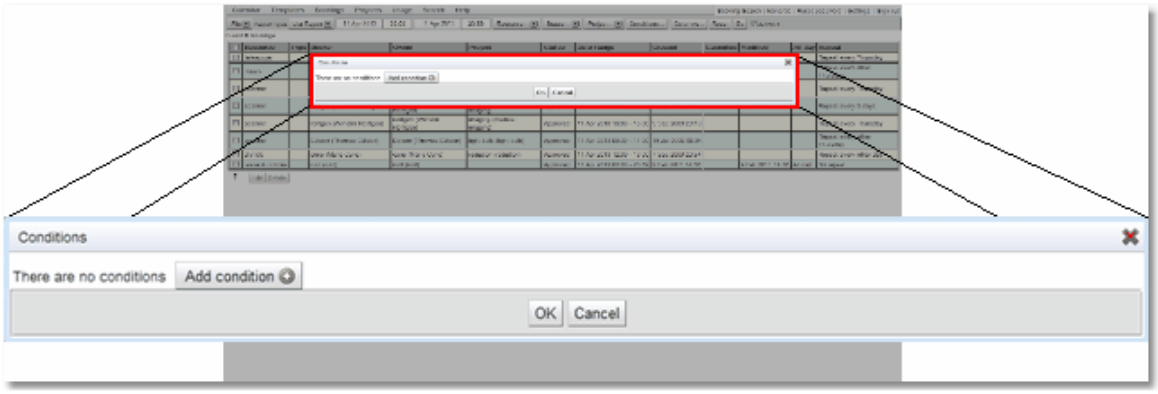
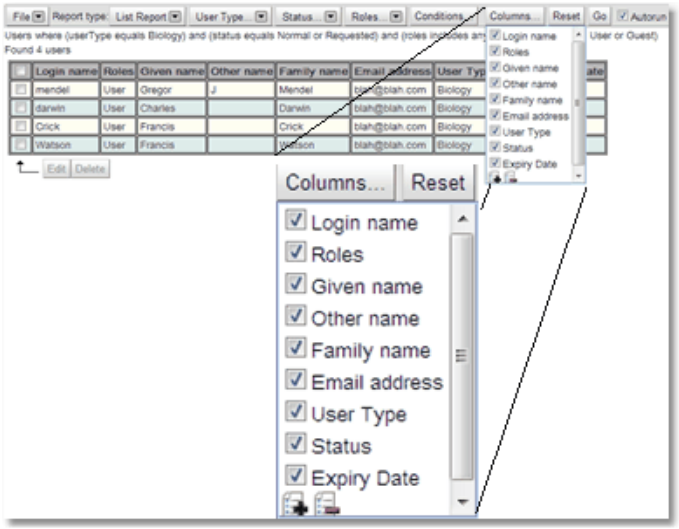
Set up additional *conditions* 250 for the search. For more information on how to set up *conditions* read the information in the Search 27 page.




And change the columns displayed in the output.

**Reset**: Resets the search *conditions* to the defaults set up on starting the search.

**Go**: Runs the search with the current *conditions*

**Autorun**: If this button is ticked then searches will run as soon as any *conditions* change. If the user will be changing a number of the *conditions* of the search, or searches will return large amounts of information it is more efficient if this is not ticked.

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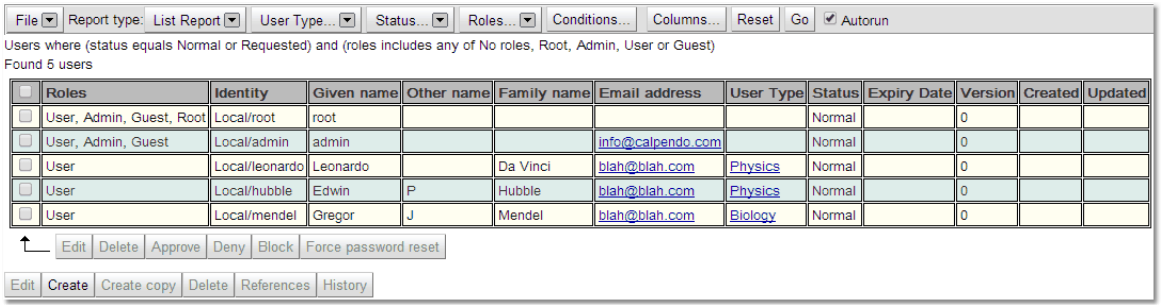
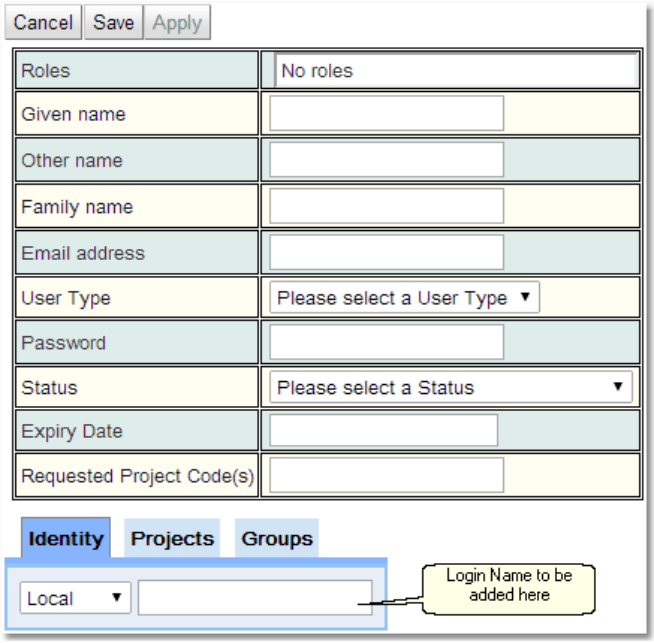
### 3.1.5 Creating Users

To add a new user that has not been requested go to the **User Search** page. There will be a list of the current users and underneath a menu bar with **Create** button enabled.


File
Report type: List Report
User Type...
Status...
Roles...
Conditions...
Columns...
Reset
Go
Autorun
Users where (status equals Normal or Requested) and (roles includes any of No roles, Root, Admin, User or Guest)
Found 5 users
Roles | Identity | Given name | Other name | Family name | Email address | User Type | Status | Expiry Date | Version | Created | Updated
User, Admin, Guest, Root | Local/root | root | | | | | Normal | | 0 | |
User, Admin, Guest | Local/admin | admin | | | info@calpendo.com | | Normal | | 0 | |
User | Local/leonardo | Leonardo | | Da Vinci | blah@blah.com | Physics | Normal | | 0 | |
User | Local/hubble | Edwin | P | Hubble | blah@blah.com | Physics | Normal | | 0 | |
User | Local/mendel | Gregor | J | Mendel | blah@blah.com | Biology | Normal | | 0 | |
Edit
Delete
Approve
Deny
Block
Force password reset
Edit
Create
Create copy
Delete
References
History

For a complete description of the standard toolbar buttons read the Toolbar Button Standard Definition[15] chapter.

In order to understand more about the *properties*[252] used for a user read the section on User Properties[54]. The login name to be used will be added under identity after choosing the appropriate authentication method. Also in order to understand more about setting up *projects*[251] and *groups*[252] for a user read the section on The User Requests Page[57] and Modifying Users[67].

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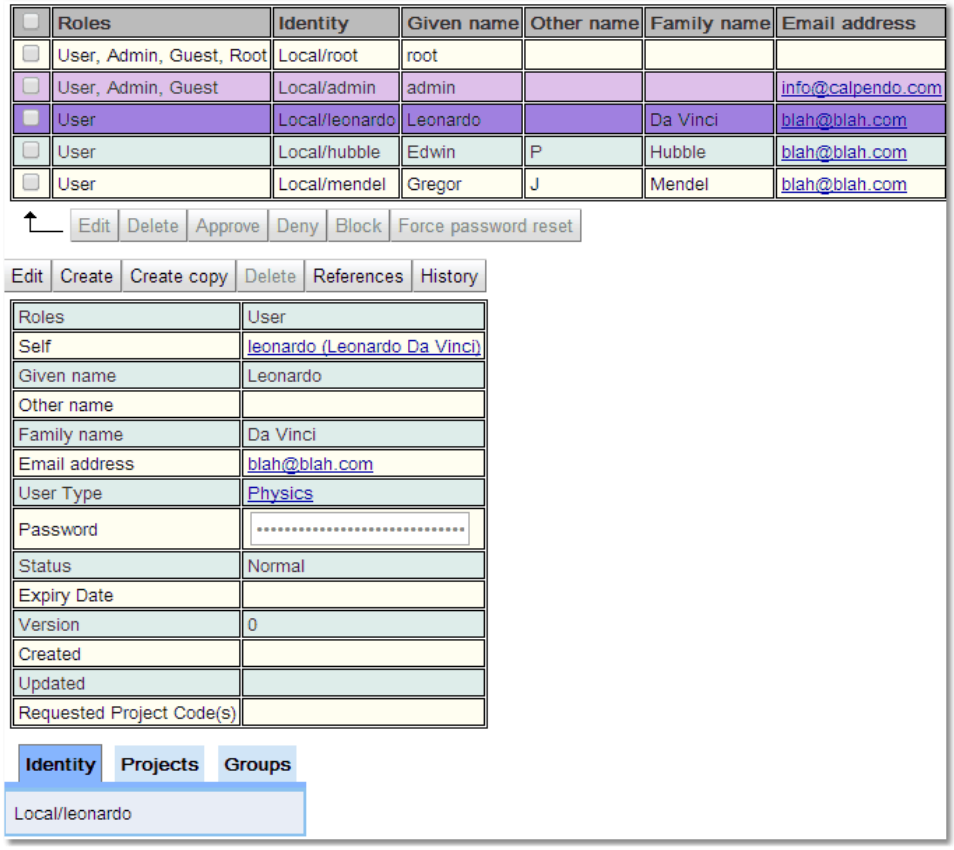
### 3.1.6 Modifying Users

To see, change or delete users, go to a list of users. Either use the dedicated **User Search** page, or use Data Explorer[46] as explained in the User Search[62] chapter to get the list.

Once the list of users has been returned they can be modified. Depending on which page was used to get the list of users either go to the Data Explorer[46] or Search[27] pages for more details on editing and saving. Described below is how to specifically change a *user groups*[252].

#### Changing A User's Password

Once the list of users is displayed, click on the user whose password needs to be changed.




Click on the **Edit** button, once in edit mode any of the users details may be changed. If changing a users password it may be an idea to change the **Status** to **Password must be reset at next login**, in order that the user must change their password again when they log in. Once the details are changed click **Save** (this will have replaced the **Edit** button).

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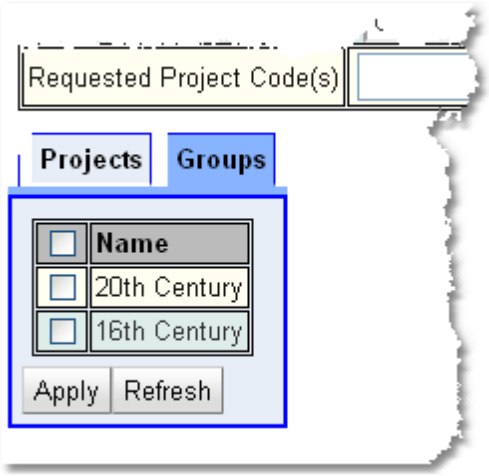
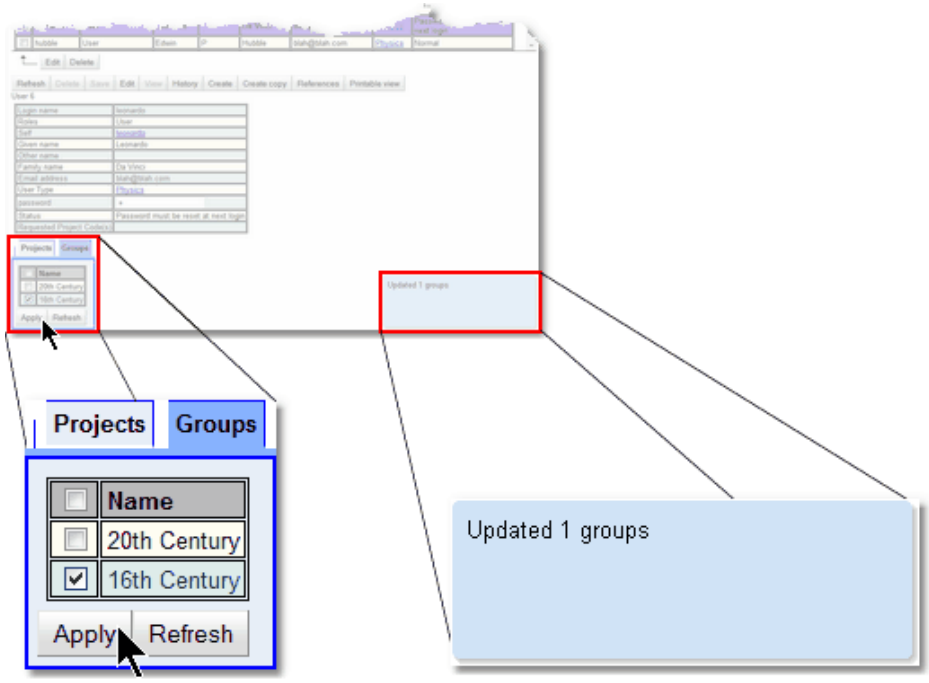
## Changing A User's User Groups

To see which *user groups* [252] a user is a member of select the user from the list of users, as described by How To Edit A Single User [49] above. The tab panel at the bottom of the page shows the user's *projects* and *group* memberships. Select the **Groups** tab and a list of all *user groups* is seen, with a check box next to each group the user is a member of.




Note: the user's details do not need to be in edit mode in order to change the *user group* membership. That's because the *user group* membership is not a *property* of the user itself, but of the *user groups*. To modify the *group* membership for the selected user:

1. Tick or untick the groups. The *groups* ticked are the ones the user is a member of. Tick the check box in the header row if all the check boxes are to be ticked or unticked.
2. Press the **Apply** button when finished.

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### Configuring The Properties Displayed

The user can control which *properties*[252] are displayed in the list of items, in the detailed view of a item. This is done in the Bakery[173].

- Properties Visible In A Biskit List[183] explains how to change the *properties* that are displayed in a list of items. Change the visibility of each of the *properties* defined on an item.
- Properties Visible In Biskit Detail[183] explains how to change the *properties* that are displayed when seeing a detailed view of an item. In this case, it affects both the read-only and editable mode detailed view of an item. Again, change the visibility of each of the *properties* defined on an item.
- Properties Visible In A Collection Editor[183] explains how to change the *properties* that are displayed in collection editors. For example, if there is a *Project* *Biskit Type*[250] that contains a list of users, then the user can change which *properties* are shown to represent those users in the *Project's* list of users.

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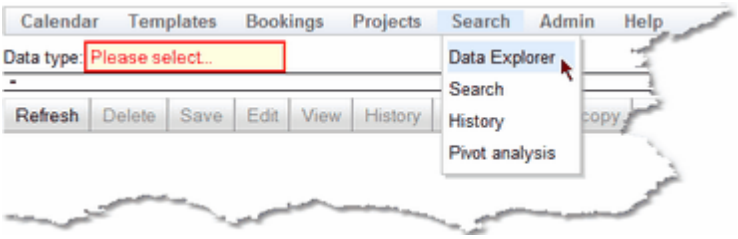
### 3.1.7 Changing A User's Settings

A user can change their own *settings*[253], as described in User Settings in the **Exprodo DB User Guide**. Sometimes, however, the administrator may want to edit another *user's settings*. This can be desirable if some users do not have *permission*[251] to modify all of their *settings*. For example, **Exprodo DB** may have been configured so that a regular user cannot choose which menu they use, whereas an administrator may have *permission* to do so. The menu is one of the *properties*[252] of a *user's settings*.

Page For Editing Another User's Settings

Currently, there is no page dedicated to editing other *user's settings*. To do this, use Data Explorer[46] and set the *Biskit Type*[250] to **Exprodo DB** *User Settings*. By default, Data Explorer[46] appears on the menu here:




### 3.1.8 Special User

There is only one special user, and that is **nobody**. This is a user whose *status*[253] should be set to **Blocked** and never used. This user is used in the following circumstance:

Sending automated emails with embedded data:

When an Automatic Email[116] is sent, it can include data taken from some *Biskits*[250]. When this happens, to make sure that it is safe to include such information, make sure that the information is only readable by whomever the email goes to, or whomever initiated the action that caused the email to be sent, as it is possible that anybody could read the email. It is therefore better to ensure that emails only include information that is readable by the special user **nobody**. If the special user **nobody** can read the data, then it's safe to put it into an email. Your administrator should have set up which data **nobody** has Permission[97] to read.

Please note that, while there are users created by default that are called **Root** and **Admin**, these are **not** special users. They have a *user role*[253] of **Root** and **Admin** respectively, and their *roles* are special, but the users are not. As many users with the **Root** role may be created as required. Any user with the **Root** role is not subjected to *permissions*[251] checks, regardless of whether it is the user **Root** or not; only the *roles* matter.

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## 3.2 Using Exprodo DB To Send Emails

**Exprodo DB** can be used to send emails to anybody that is registered with **Exprodo DB**, since all users must provide an email address. Emails can also be sent to any email address as required. This can be used as a means of general communication so that the administrator doesn't necessarily need to maintain email distribution lists. This works because if you want to send emails to people who use your *resources*[252], then they are probably also **Exprodo DB** users. If you are running **Exprodo DB** on your own server, **Exprodo DB** can make a secure connection to the mail server for sending email see Global Preferences Email on how to set this up..

**Exprodo DB** can also be used to send email to people who have a *booking*[250] over the next few days, or whatever period required. This is useful when there's a problem with a *resource* that needs to be brought to the attention of those that are due to use it.

Send emails using the **Manual Email** page, which is placed by default onto the menu as **Admin-->EMail-->Manual Email**.

The page sets up the email subject and email message and priority, as though using any normal email client. There are then three tabs, named **To**, **CC** and **BCC**, to specify who the email is sent to, copied to and blindly sent to. As long as someone is in the **CC** or **BCC** list then there doesn't need to be anything in the **To** list.

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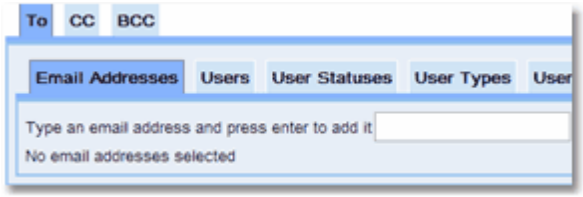
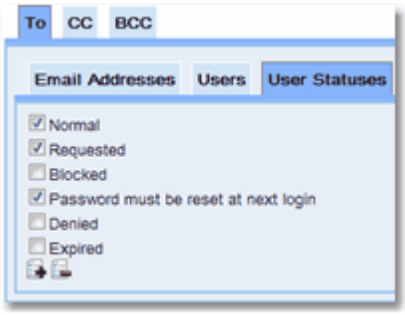
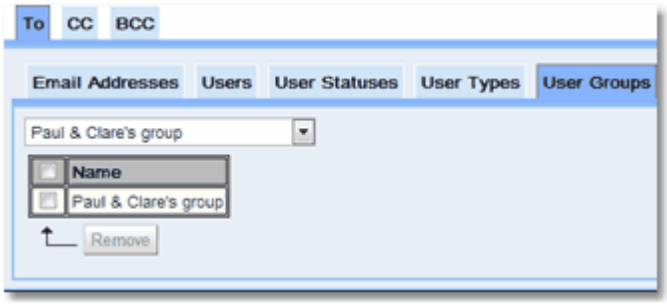
Each of the **To**, **CC** and **BCC** tabs have the same content, with tabs as follows:

| Tab Name | Description | |
|---|---|---|
| Email Addresses | This adds any number of specific email addresses. This means emails can be sent to people who are not known by **Exprodo DB**. |  |
| Users | This chooses individual users to send the email to. Use the drop down to select the users required. Use the tick box to choose which users you wish to remove and then click the **Remove** button. | |
| User Statuses | This chooses the *statuses*[253] of users that are allowed to received the email. Note that the recipients will be those specified by any of the other tabs that are not also prohibited by this **User Statuses** tab. |  |
| User Types | If **Exprodo DB** is configured so that users are classified by their *user type*[253], then select one or more *user types* so that all users with those *users types* should receive an email. | |
| User Groups | Select any number of *user groups*[252] to send email to. Use the drop down to select the *user groups* required. Use the tick box to choose which *user groups* to remove and then click the |  |

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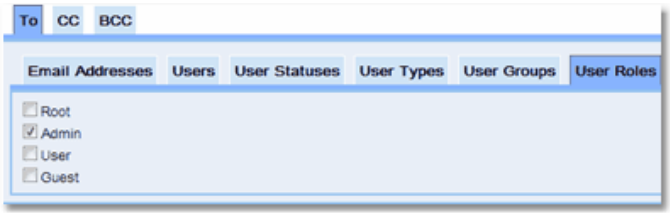
| Tab Name | Description | |
|---|---|---|
| | **Remove** button. | |
| User Roles | Add any user to the recipient list that has the selected *roles*[253]. |  |



When the email and its recipients are ready, then use the buttons in the button bar at the bottom:

| Button | Description |
|---|---|
| **Send** | This sends the email |
| **Show Recipients** | **Exprodo DB** calculates who the email would be sent to and shows a list of those users without actually sending the email. Use this to verify that the email will target the expected users. If an email address appears more than once in any of the tabs then only one email is sent with To overriding CC overriding BCC to decide which address line is used. |
| **Reset** | After using the **Manual Email** page, press the **Reset** button to reset the page back to its original content, ready to compose a new email. |

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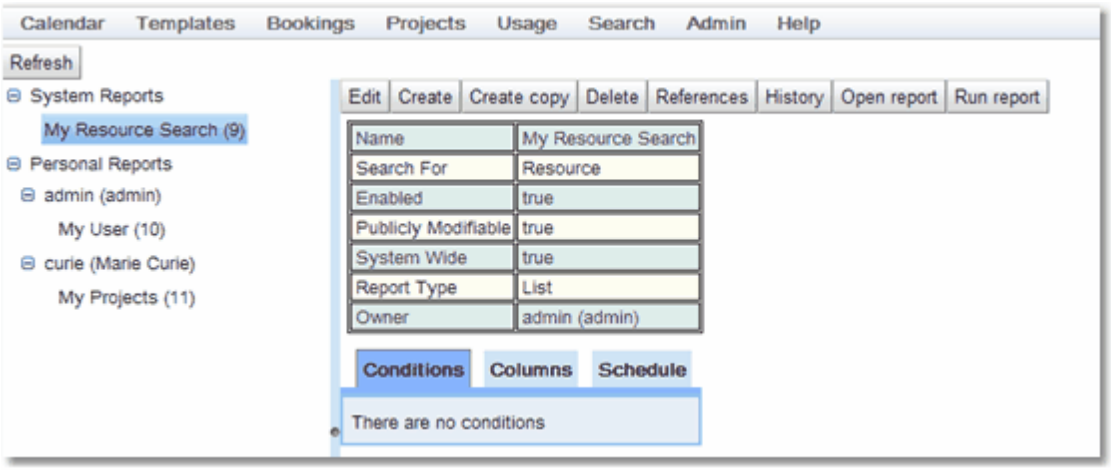
## 3.3 Report Manager

The **Report Manager** allows an **Admin** user to see reports for all users as well as the system reports.To access the **Report Manager** page it is found on the **Admin** menu. However, the administrator may have configured **Exprodo DB** so that the menu is different.

The page is split into two. On the left is a list of the **System Reports** (those that anyone can see) and all the **Personal Reports**. On the right is the area where **Reports** can edited, created and deleted. Where the page splits can be moved to change the space available for each of the sides.




In order to understand how to create and edit reports read the the Reports[40] section of the **Exprodo DB User Guide**.

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## 3.4 Import

**Exprodo DB** supports the import of data using comma-separated values (csv). This is found on the **Admin->Import** menu.

In order to do this an import file needs to be created. Only information for a single *Biskit Type* [250] can be imported at a time. The exception to this is, if importing data belonging to a **Slave** *Biskit Type*, that needs to be imported with the **Master** *Biskit Type* data as if the **Slave** *properties* [252] actually belonged to the **Master** rather than the **Slave**.

Once the import files have been created they can be used in the **Exprodo DB** import page to import your information.

### 3.4.1 Example Import Files

The file should have a header row which defines the *properties* [252] that are going to be imported, and then one row for each object of the *Biskit Type* [250]. Use the Search [27] page or the Bakery [173] to find the names for the *properties*. All the fields need to be comma separated.

To modify the value of a *property* that is from a component *biskit* [250], values to all the *properties* on that component must be provided. Any *properties* not mentioned will be attempted to be set to null. If this fails then an error will occur.
Eg, When importing users and setting a new value for **userIdentity.authenticationMethod**, then a value for **userIdentity.loginName** must also be set.
If a new value for **userIdentity.authenticationMethod** is set and a new value for **userIdentity.loginName** is not set, then the **userIdentity.loginName** will be set to null.

A *property* that is used to identify the *biskit* to be updated can itself be updated. For example, when importing users, users could be identified by their **email** *property* (if it's unique) and the import could also modify that **email** *property*. To do this, two **email** columns in the CSV file are required.

i.e.
**email,email**
**tim@conaptic.com,timb@conaptic.com**

The first column would then be the key *property* to identify the user to be changed and the second column would be the new value of the **email** *property*.

Use the following options **Key:** and **Ignore:** (typed before the property name) to pre select the properties that will be key fields or fields to be ignored.

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## Example File For Importing A User

The **User** record that will be created from this file:

| Login name | Timb |
|---|---|
| Roles | User |
| Self | Timb (Tim Bilderbeck) |
| Given name | Tim |
| Other name | |
| Family name | Bilderbeck |
| Email address | blah@conaptic.com |
| User Type | Physics |
| Password | •••••• |
| Status | Normal |
| Expiry Date | |
| Requested Project Code(s) | |

| Name | Value | Comments |
|---|---|---|
| userIdentity.loginName | Timb | String |
| userIdentity.authenticationMethod | Local | Needs to match available authentication method exactly. |
| roles | 4 | Set by bits<br>1 = **Root**<br>2 = **Admin**<br>4 = **User**<br>8 = **Guest**<br>See User Roles 190 for more information. |
| givenName | Tim | String |
| familyName | Bilderbeck | String |
| email | blah@conaptic.com | String |
| userType.name | Physics | Needs to match name exactly |
| password | timbil | Depends on system configuration |
| status | Normal | Requested, Normal, Blocked |

Notice the order of the *properties* does not matter. Depending on how the system is configured password may be a compulsory *property* and may have a minimum number of characters and/or a combination of alphanumerics.

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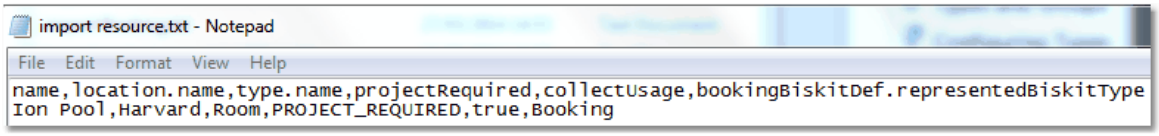
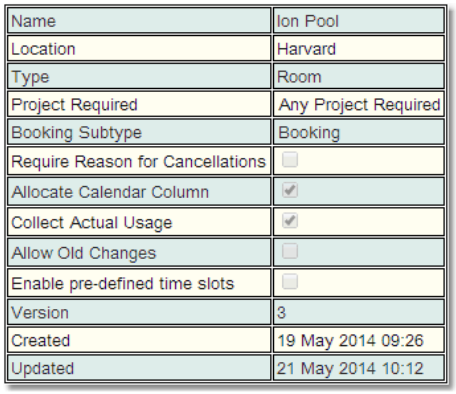
## Example File For Importing A Resource

A *resource*[252] is a *Biskit Type* used in **Calpendo** to store information about *resources* that can be booked in a facility.




The **Resource** record that will be created from this file:



| | |
|---|---|
| Name | Ion Pool |
| Location | Harvard |
| Type | Room |
| Project Required | Any Project Required |
| Booking Subtype | Booking |
| Require Reason for Cancellations | |
| Allocate Calendar Column | |
| Collect Actual Usage | |
| Allow Old Changes | |
| Enable pre-defined time slots | |
| Version | 3 |
| Created | 19 May 2014 09:26 |
| Updated | 21 May 2014 10:12 |

| Name | Value | Comments |
|---|---|---|
| name | Ion Pool | String |
| location.name | Harvard | Needs to match name exactly |
| type.name | Room | Needs to match name exactly |
| projectRequired | PROJECT_REQUIRED | PROJECT_REQUIRED or PROJECT_NOT_REQUIRED or PROJECT_WITH_RESOURCE_ENTRY |
| collectUsage | true | true or false |
| bookingBiskitDef.representedBiskitType | Booking | The Biskit Type to be used for bookings of this resource |

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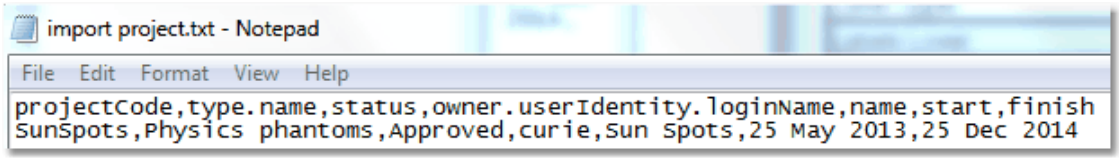
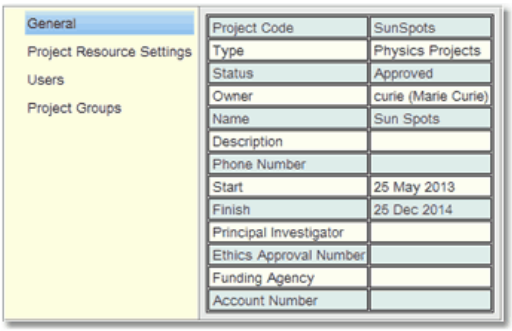
## Example File For Importing A Project

A *project*[251] is a *Biskit Type* used in **Calpendo** to store information about *projects*.


import project.txt - Notepad
File Edit Format View Help
projectCode,type.name,status,owner.userIdentity.loginName,name,start,finish
SunSpots,Physics phantoms,Approved,curie,Sun Spots,25 May 2013,25 Dec 2014

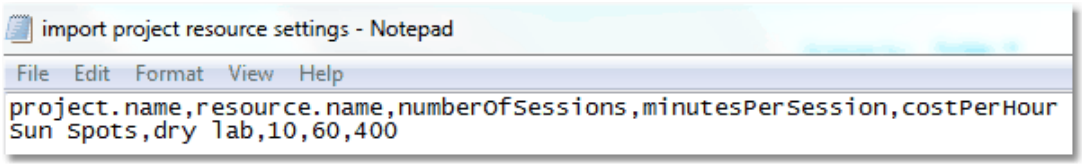
The **Project** record that will be created from this file:

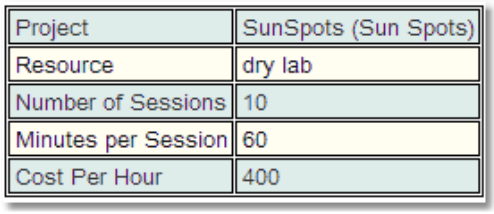



| Name | Value | Comments |
|---|---|---|
| projectCode | SunSpots | String |
| type.name | Physics Project | Needs to match name exactly |
| status | Approved | Approved, Requested, Denied, Terminated |
| owner.userIdentity.loginName | curie | Login name |
| name | Sun Spots | String |
| start | 25 May 2013 | Date |
| finish | 25 Dec 2014 | Date |

*Projects* have other information attached to them but they are stored in different *Biskit Types*. These are used to store the *Project Resource Settings*[251], **Users** and *Project Groups*[251] *properties*. In order to import this information, first import the *project* information and then import each of the other three *Biskit Types* one after another.

For example importing the *Project Resource Settings* for the above project:




| Name | Value | Comments |
|---|---|---|
| project.name | SunSpots | Needs to match name exactly |
| resource.name | Physics Project | Needs to match name exactly |
| numberOfSessions | 10 | Integer |
| minutesPerSession | 60 | Integer |
| costPerHour | 400 | Double |

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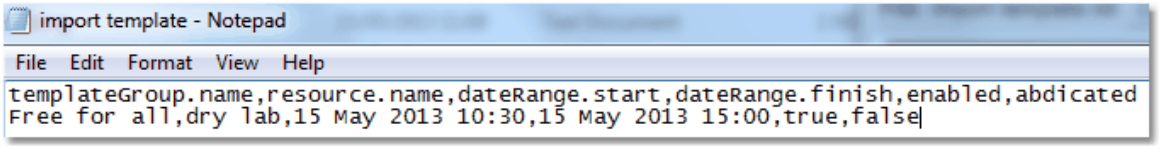
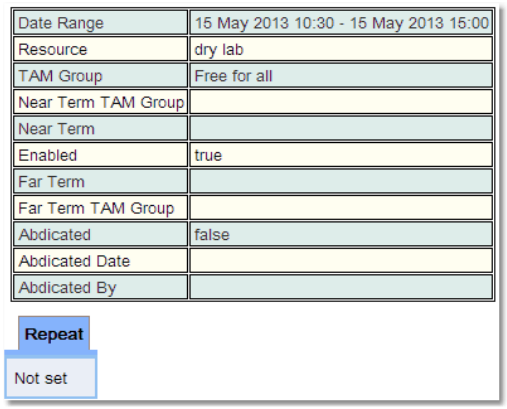
## Example File For Importing A Time Template

A *Time Template* 252 is a *Biskit Type* used in **Calpendo** to store information about when *bookings* 250 for *resources* can take place and how they can be automatically approved.


import template - Notepad
File Edit Format View Help
templateGroup.name,resource.name,dateRange.start,dateRange.finish,enabled,abdicated
Free for all,dry lab,15 May 2013 10:30,15 May 2013 15:00,true,false

The **Template** record that will be created from this file:




| Name | Value | Comments |
|---|---|---|
| date Range.start | 15 May 2013 10:30 | Date and Time |
| dateRange.finish | 15 May 2013 15:00 | Date and Time |
| templateGroup | Free for All | string |
| Enabled | true | true or false |
| Abdicated | false | true or false |

To import repeat *Time Templates* see below for additional information about importing *repeat bookings*.

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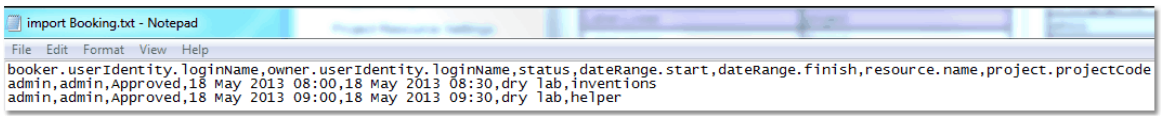
## Example File For Importing Two Bookings

A *booking* is a **Calpendo** object that has a *status* 250, start and finish date and a few other *properties*.


import Booking.txt - Notepad
File Edit Format View Help
booker.userIdentity.loginName,owner.userIdentity.loginName,status,dateRange.start,dateRange.finish,resource.name,project.projectCode
admin,admin,Approved,18 May 2013 08:00,18 May 2013 08:30,dry lab,inventions
admin,admin,Approved,18 May 2013 09:00,18 May 2013 09:30,dry lab,helper

The **Booking** record that will be created from the first import line in this file is:

| | |
|---|---|
| Resource | dry lab |
| Type | |
| Booker | admin (admin) |
| Project Resource Settings | dry lab 0 scans of 60 mins for £300.0 |
| Owner | admin (admin) |
| Project | inventions (inventions) |
| Status | Approved |
| Approved by template | false |
| Warned | |
| Date Range | 18 May 2013 08:00 - 08:30 |
| Created | 16 May 2013 10:23 |
| Cancelled | |
| Modified | |
| All day | |
| Description | |
| Reminder Trigger Time | |
| Reminder Sent | false |
| Remind Booker | false |
| Remind Owner | false |
| Remind Project Owner | false |
| Remind Project Users | false |

Repeat

Not set

| Name | Value | Comments |
|---|---|---|
| booker.userIdentity.loginName | admin | Needs to match login name exactly |
| owner.userIdentity.loginName | admin | Needs to match login name exactly |
| status | Approved | **Approved, Requested, Cancelled, Denied** |
| dateRange.start | 18 May 2013 08:00 | Date and Time |
| dateRange.finish | 18 May 2013 08:30 | Date and Time |
| resource.name | dry lab | Needs to match name exactly |
| project.ProjectCode | inventions | Needs to match project code exactly |

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When importing *repeat*[252] *bookings* the repeat sub *Biskit Type* for the *repeat booking* needs to be defined as well as all the *properties* defined for that *Biskit Type* and all the properties of the parent *Biskit Type* **Repeat**. Any *property* not defined will have its value set to null.

| Biskit Type | Property | Type | Example Value |
|---|---|---|---|
| Repeat | repeat.biskitType (must always be present) | Biskit | AnnualRepeat<br>DailyRepeat<br>MonthlyRepeatByDate<br>MonthlyRepeatByDay<br>WeeklyRepeat |
| | repeat.start | Date | 12 January 2015 13:00 |
| | repeat.finish | Date | 12 January 2999 14:00<br>2999 for never ending repeats |
| | repeat.repeatEvery | int | 1 |
| | repeat.repeatType (must match repeat.biskitType) | JavaEnum | Annually<br>Daily<br>Monthly by date<br>Monthly by day<br>Weekly |
| Annual Repeat | repeat.dayOfMonth | Int | 1-31 |
| | repeat.monthOfYear | int | 0-11 with 0 = January |
| Daily Repeat | None | | |
| Monthly Repeat By Date | repeat.dayOfMonth | int | 1-31 |
| Monthly Repeat By Day | repeat.dayOfWeek | int | 1-7 with 1 = Sunday |
| | repeat.weekOfMonth | int | 1-5 |
| Weekly Repeat | repeat.sunday | Boolean | True or False |
| | repeat.monday | Boolean | True or False |
| | repeat.tuesday | Boolean | True or False |
| | repeat.wednesday | Boolean | True or False |
| | repeat.thursday | Boolean | True or False |
| | repeat.friday | Boolean | True or False |
| | repeat.saturday | Boolean | True or False |

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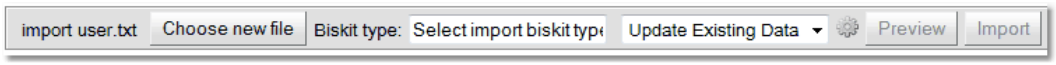
### 3.4.2 The Import Page

When importing data you can specify whether data is imported if there are any errors,or that no data is imported from the file if any errors occur, errors include *Permissions* 251 failing to allow creation or updating of records.
Examples of how different error types are handled can be found in the section on Handling Import File Errors 85.

On entering the **Import** page it will look like:

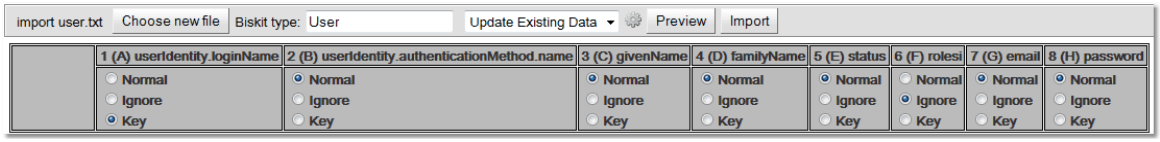
Press **Browse...** (or **Choose File**) to select the file to import. At this point **Exprodo DB** will attempt to decide which *Biskit Type* 250 is being imported from the header information. If it cannot determine the *Biskit Type*, the user will need to select it.




Once the **Import** page knows which *Biskit Type* it is importing it will look like this:

At this point decide whether to choose to **Update Existing Data** or **Insert New data**. If updating data then import needs to know which columns to use as the key fields to find the appropriate records to update. Click on the **Key** option below the column headings of those *properties* 252 that are keys fields or put **Key**: before the *property* name in the file.

In this example for importing **User** data, the key is specified to be the combination of **userIdentity.loginName and userIdentity.authenticationMethod.name**, as the combination of these two will be unique.

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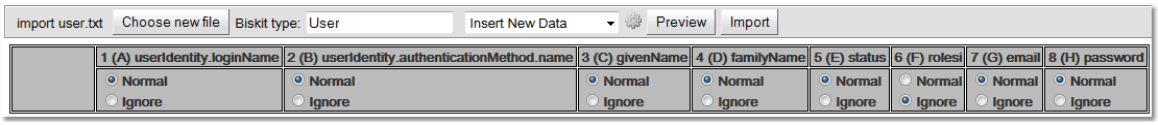
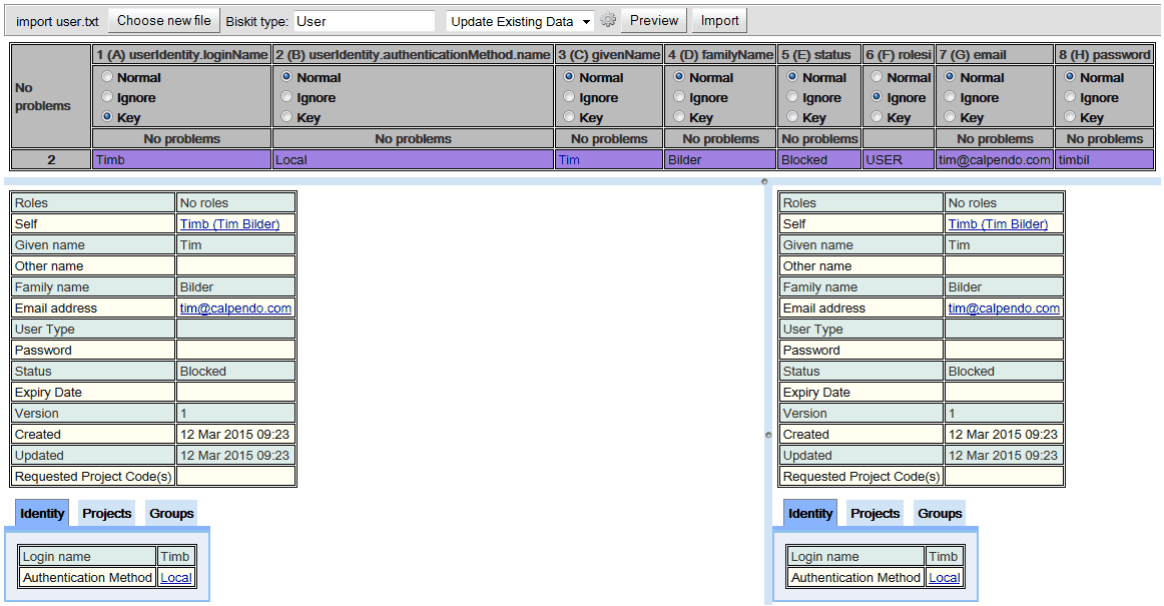
In this example for importing **User** data, **Insert New Data**. has been chosen, the **Key** option has disappeared as no longer required.

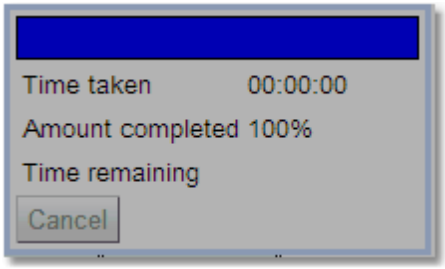



Choose the columns to be ignored during the import by clicking the **Ignore** option below the *property* name or by putting **Ignore:** before the *property* name in the file, and then press the **Preview** button to see the data before importing or go straight to importing by pressing the **Import** button.

If previewing once the data has been loaded into the top pane, select an individual record and see the record to be created/updated in the bottom left pane, and if doing an update the original record is in the bottom right pane.




Press the **Import** button to import the data into **Exprodo DB**. While the import is being run a progress bar will be displayed which will show the time taken, % amount completed and any errors. There is also a **Cancel** button to cancel the import. When the import completes a pop up will appear in the bottom right hand corner of the screen saying **Import Completed**.

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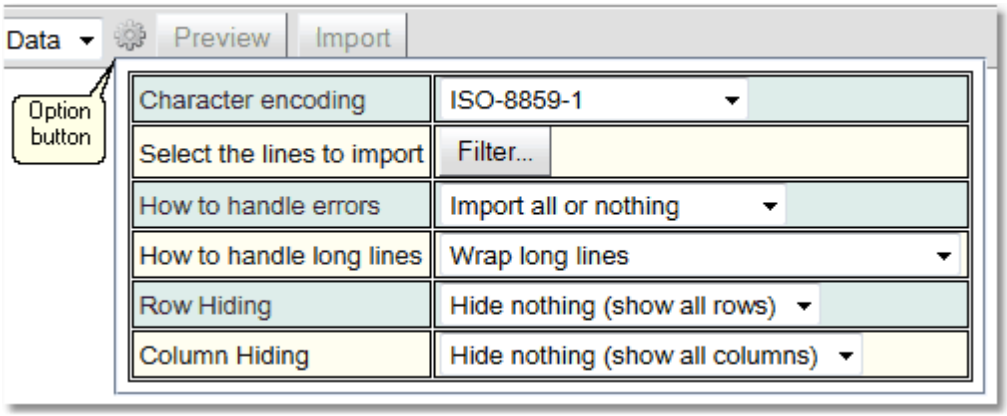
## Importing Options

Click on the options button to see all the options available for viewing and importing the data file




| Option | Description |
|---|---|
| Character encoding | While importing Exprodo DB guesses at the character encoding used for the file being imported, and allows the administrator the chance to choose the one to use, allowing non-ASCII files to be imported. |
| Select the lines to import | Use the **Filter...** button to set up *conditions* 250 to define which rows will be imported. |
| How to handle errors | Choose **Import any that do not fail** which will import all records that do not have errors, or **Import all or nothing**, which will only import the records if they would all succeed. |
| How to handle long lines | Whether lines should be wrapped making the box deeper, **Wrap long lines,** or whether to make the table wider to deal with long lines. **Do not wrap long lines; make the table wider.** |
| Row Hiding | Whether to hide those rows that are being ignored for import, **Hide ignored rows**, or to hide all rows without an error, **Hide error-free rows**. Press the **Preview** button to see the results of any changes to this setting. |
| Column Hiding | Whether to hide those columns that are being ignored for import, **Hide ignored columns**, or to hide all columns without an error, **Hide error-free columns**. Press the **Preview** button to see the results of any changes to this setting. |

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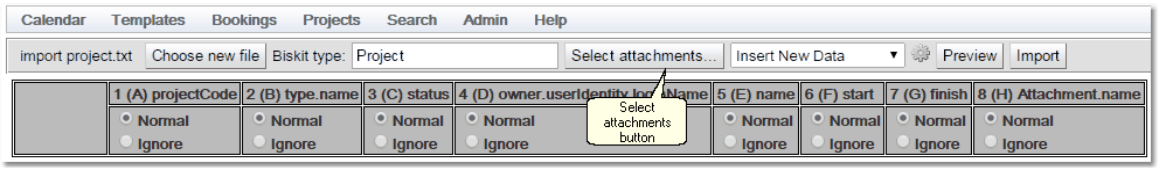
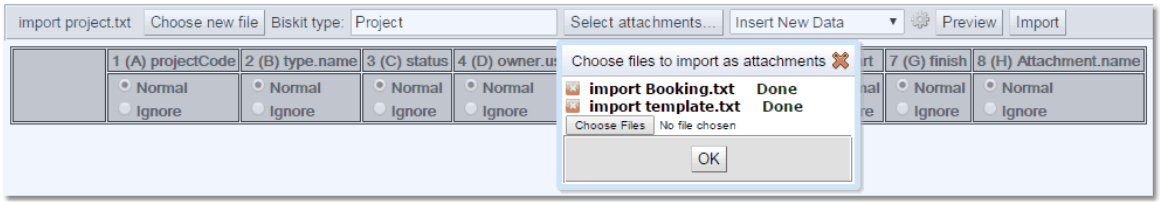
## Importing File Attachments

If any of the *properties* to be imported include the **Attachment** *BiskitDef*[250], then the user is supplied with an additional button to select the list of attachments to be imported. This needs to be done before the **Preview** or **Import** buttons are pressed.




Once the attachment pop up is present, use the **Browse...** (or **Choose File**) button to find all the attachments required for the import. Once selected click OK and move on to **Preview** and **Import** the data.




## Handling Import File Errors

During the import process there are three main types of errors.

1. Incorrect *property* names or labels in the header of the import file. (Header errors)
2. Incorrect data in a record, stopping **Import** from resolving property values. (Data Errors)
3. Failure to import due to internal checking. (Violation errors)
    a. Incorrect data in a record, causing *Permissions* to fail to allow creation of records(e.g. password too short).
    b. *Permissions* failing to allow creation or updating of records.

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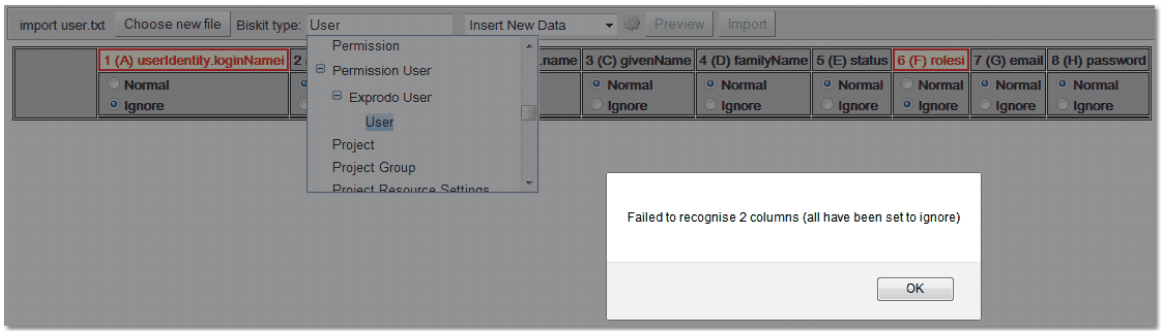
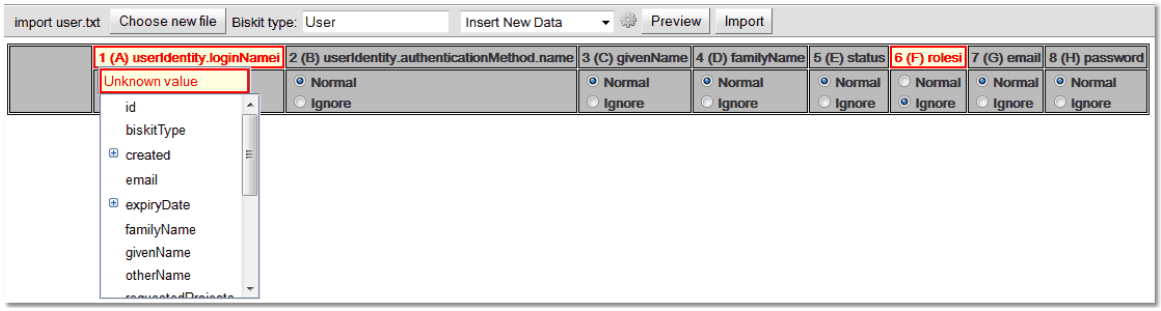
## Header Errors

Header errors are found when the import file is first loaded using the **Send** button. Once **Import** has decided on the *Biskit Type* being imported or the user has selected the correct *Biskit Type*, the header information is loaded. If any of the headers cannot be resolved to *property* names or *property* labels (in a case insensitive manner if possible) then those headers are marked in red. A pop up will inform the user how many column headings have not been recognised. Import then updates those columns from **Normal** to **Ignore**, so the user can proceed with the import without those columns.




These errors can be fixed in the Import page. Just click on any red header and you will get a drop down box with a complete lists of this *Biskit Types properties*. Select the correct one, and the error will be removed. Once done the column will be moved from **Ignore** to automatically.

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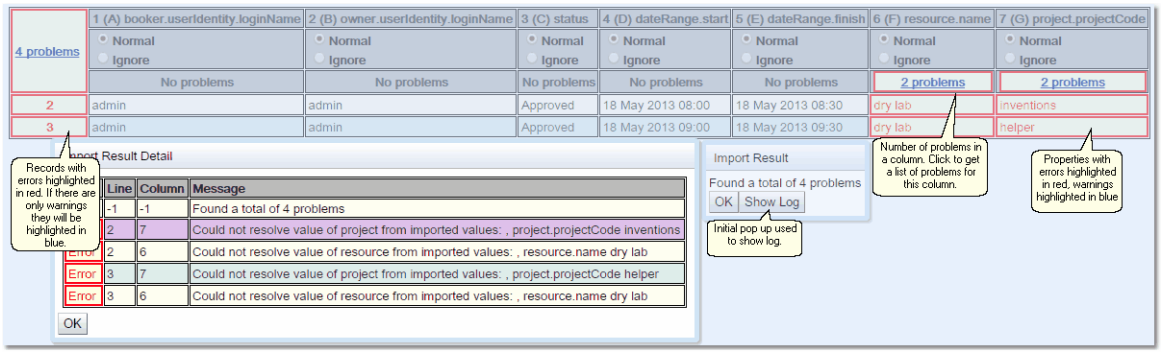
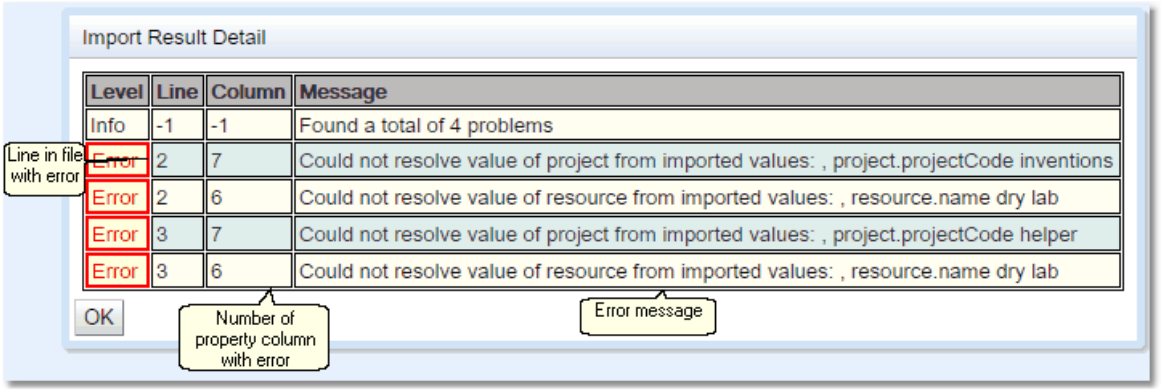
## Data Errors

Data errors are found either during the preview of the data, of if a preview is not done, during import.


4 problems
1 (A) booker.userIdentity.loginName
2 (B) owner.userIdentity.loginName
3 (C) status
4 (D) dateRange.start
5 (E) dateRange.finish
6 (F) resource.name
7 (G) project.projectCode
Normal
Ignore
No problems
2 problems
admin
Approved
18 May 2013 08:00
18 May 2013 08:30
18 May 2013 09:00
18 May 2013 09:30
dry lab
inventions
helper
Import Result Detail
Line
Column
Message
Found a total of 4 problems
Could not resolve value of project from imported values: , project.projectCode inventions
Could not resolve value of resource from imported values: , resource.name dry lab
Could not resolve value of project from imported values: , project.projectCode helper
Could not resolve value of resource from imported values: , resource.name dry lab
OK
Show Log
Records with errors highlighted in red. If there are only warnings they will be highlighted in blue
Initial pop up used to show log.
Number of problems in a column. Click to get a list of problems for this column.
Properties with errors highlighted in red, warnings highlighted in blue

If there are problems a pop up will appear use the **Show Log** button to show a complete list of the problems. Records with an error will have their record number highlighted in red as will those *property* values which are causing an error. If a record has only warnings it will highlighted in blue, as will those *property* values which are just warnings. Moving the cursor over a *property* with an error/warning will result in a tool tip describing the error/warning. Also for each column you can see the number of problems. If there are any problems in a column clicking on the number of problem text will produce a pop up which will show the problems for just that column.


Import Result Detail
Level
Line
Column
Message
Info
-1
Found a total of 4 problems
Error
2
7
Could not resolve value of project from imported values: , project.projectCode inventions
6
Could not resolve value of resource from imported values: , resource.name dry lab
3
Could not resolve value of project from imported values: , project.projectCode helper
Could not resolve value of resource from imported values: , resource.name dry lab
OK
Line in file with error
Number of property column with error
Error message

The problem log will list theproblems, showing the line and column the problem occurs on as well as the problem message. Clicking on the an errors column will scroll the file to the error, and it will be coloured blue to stand out.

In order to fix these types of problems go back to the original import document and fix them there before loading it back into the **Import** page. Remember once the file to be imported has been updated, save it before reloading the file into **Exprodo DB Import**.

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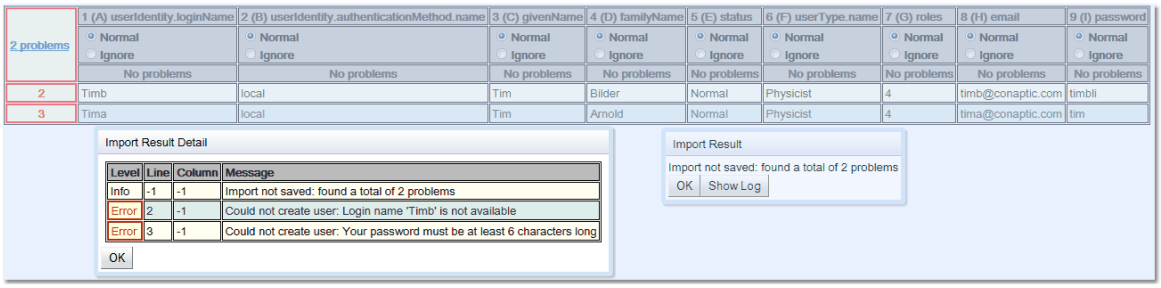
## Violation Errors

Violation errors are found during the import of the data into the database. These are errors that occur when the **Exprodo DB** is trying to create or update the database. During this process all the *Permissions* are checked.


2 problems
1 (A) userIdentity.loginName
2 (B) userIdentity.authenticationMethod.name
3 (C) givenName
4 (D) familyName
5 (E) status
6 (F) userType.name
7 (G) roles
8 (H) email
9 (I) password
Normal
Ignore
No problems
2 Timb local Tim Bilder Normal Physicist 4 timb@conaptic.com timbli
3 Tima local Tim Arnold Normal Physicist 4 tima@conaptic.com tim
Import Result Detail
Level Line Column Message
Info -1 -1 Import not saved: found a total of 2 problems
Error 2 -1 Could not create user: Login name 'Timb' is not available
Error 3 -1 Could not create user: Your password must be at least 6 characters long
OK
Import Result
Import not saved: found a total of 2 problems
OK
Show Log

If there are errors a pop up will appear, use the **Show Log** button to show a complete list of the errors. Records with an error will have their record number highlighted in red. Moving the cursor over a record number with an error will result in a tool tip coming up describing the error. The error log just shows the records that failed to import and a reason for that failure. If there are two violation reasons that will cause a record to fail, only one is found, and when fixed, the second reason will cause a failure next time around. This is because the *Permissions* are run until one fails and the rest are then ignored.

In the example above the third record has both a password that is too short and an illegal email address, but only the short password has been found, the illegal email address has been found for the second record but not the third. So after fixing the password for the third record and the email address for the second record, if an attempt was made to import the file again with no other changes, another error would occur this time an invalid email for the third record.

In order to fix these types of errors go back to the original import document and fix them there before loading it back into the **Import** page. Remember once the file to be imported has been updated, save it before reloading the file into **Exprodo DB Import**.

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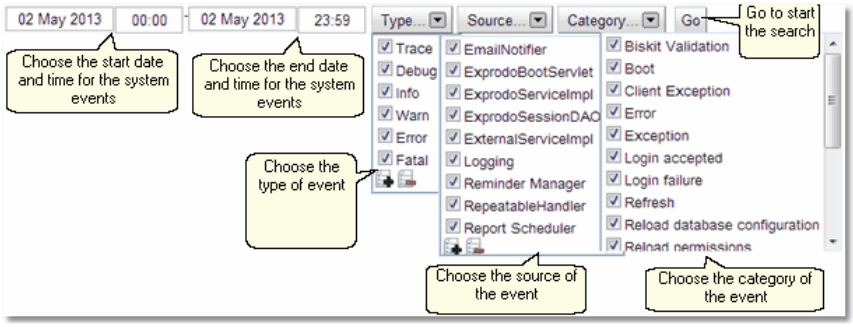
## 3.5 System Events

The **System Events** page provides a convenient way to search for and display **Exprodo DB**'s record of *events* [252] such as people logging in or emails being sent. It is recommended that only those who administer **Exprodo DB** should have this added to their menu. To access the **Systems Events** page it is found on the **Admin** menu. However, the administrator may have configured **Exprodo DB** so that the menu is different.

The **Systems Events** page is very similar to the Search [27] page. The *events* returned can be filtered by time, type, source and category.Unlike other Search [27] pages there is no auto run option. When the page opens up it looks like the following:




Once the search has run the results will look similar to below, clicking on an *event* will bring up the expanded view for that *event* below the list view.

| When | Source | Category | Type | User | Affected Type | Affected ID |
|---|---|---|---|---|---|---|
| 2 May 2013 00:17 | RepeatableHandler | Update | Info | | | |
| 2 May 2013 02:00 | Logging | Error | Error | | | |
| 2 May 2013 02:00 | Reminder Manager | Reminder unsent | Error | | Booking | 8374 |
| 2 May 2013 03:17 | RepeatableHandler | Update | Info | | | |
| 2 May 2013 07:00 | Logging | Error | Error | | | |
| 2 May 2013 07:00 | Reminder Manager | Reminder unsent | Error | | Booking | 7694 |
| 2 May 2013 07:17 | RepeatableHandler | Update | Info | | | |
| 2 May 2013 08:17 | RepeatableHandler | Update | Info | | | |
| 2 May 2013 09:10 | Logging | Exception | Error | | | |
| 2 May 2013 09:10 | Logging | Exception | Error | | | |
| 2 May 2013 09:10 | Logging | Exception | Error | | | |
| 2 May 2013 09:10 | Logging | Exception | Error | | | |
| 2 May 2013 09:15 | Logging | Exception | Error | | | |
| 2 May 2013 09:15 | Logging | Exception | Error | | | |
| 2 May 2013 09:17 | RepeatableHandler | Update | Info | | | |
| 2 May 2013 09:20 | Logging | Exception | Error | | | |
| 2 May 2013 09:26 | Logging | Exception | Error | | | |
| 2 May 2013 09:26 | Logging | Exception | Error | | | |

| | |
|---|---|
| When | 2 May 2013 08:17 |
| Source | RepeatableHandler |
| Category | Update |
| Type | Info |
| User | |
| Affected Type | |
| Affected ID | |
| Message | 2 objects affected, yielding 4 changes |

Detail

| Type | Original PK | Repeat Type | Affected PK | Action | Range |
|---|---|---|---|---|---|
| Template | 10 | Weekly | 16176 | Update | 2013-05-02 08:00 - 2013-05-02 13:00 |
| | | | 10 | Create | 2013-05-09 08:00 - 2999-12-31 13:00 |
| Booking | 7694 | Weekly | 9049 | Update | 2013-05-02 08:00 - 2013-05-02 10:30 |
| | | | 7694 | Create | 2013-05-16 08:00 - 2999-12-31 10:30 |

If there are any questions about *system events* please get in touch with **Exprodo DB** customer support (info@calpendo.com).

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# Part IV

# 4 Exprodo DB Configuration Guide

**Exprodo DB** was designed from the very beginning to be flexible, so that it could meet the requirements of many different types of facilities. It's targeted at people who have shared data that needs to be viewed and updated through a web interface.

The **Exprodo DB Configuration Guide** describes how to change **Exprodo DB** so that it works the way you want it to. This does not normally need to be read by non-administrators, nor by anybody who only needs to do the day-to-day administration. This guide should be read in conjunction with the **Exprodo DB User Guide** 10

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## 4.1 Types and Groups

For various reasons, it is useful to be able to split users into sets of one sort or another. This is done in **Exprodo DB** using types and groups. These are two independent means of segregating users.

The Difference Between Types and Groups

The key thing to understand is that a user has precisely one type, but may belong to any number of groups.

**Exprodo DB** should be configured with types and groups that make sense for the current installation. A default installation comes with no types and no groups. If your installation does use *User Types* 253, then when a user registers, they will be asked what their type is. An administrator can override that and change it when they approve the user, but the user will always have a single type. When users have types, then the type can be used for Permissions 97, Automatic Emails 116 and Manual Emails 71.

*U*se *User Types* if there is some logical separation of users that fits the notion of a user having precisely one type. For example, it may be that there are multiple departments in your company, with everybody belonging to only one department. If that were the case, then perhaps have as many *User Types* as there are departments.

*User Groups* 252 can also be used for Permissions 97, Automatic Emails 116 and Manual Emails 71, the same as for types. However, there is greater flexibility due to the way a user can belong to multiple groups (or no groups). So, while a *user's type* may indicate their department (or whatever), groups could be created that reflect any sort of grouping that makes sense in your situation. Given this apparent flexibility in groups, one might ask what the point of types is. The answer is that it is sometimes useful to have a taxonomy in which you know every user has a type, whereas a user may belong to no groups at all.

***See also:***

Configuring Types And Groups 94.

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## 4.2 Configuring Types And Groups

The **Types And Groups Editor** is used to configure the types and groups in the system. Before reading more about how to configure them, please take a look at which describes what a type and a group is, and how an item can have exactly one type but may be a member of many groups (including zero).

When it comes to configuring types and groups in **Exprodo DB**, consider first whether there is a good way to categorise the users such that they each fall into precisely one category.

For example, distinguish between students, staff and external users using that for the *user type*[253]. Types are used to control Permissions[97], Automatic Emails[116] and Manual Emails[71].

### Types And Groups Editor

The **Types and Groups Editor** page consists of three parts:

1. The menu tool bar: this is the tool bar at the top of the page, and all the buttons operate on all types and groups at a time.
2. The left pane: this allows the selection of a type or group or an item within a type or group
3. The right pane: this shows the detail of the currently selected type or group item

For a complete description of the standard toolbar buttons read the Toolbar Button Standard Definition[15] chapter.

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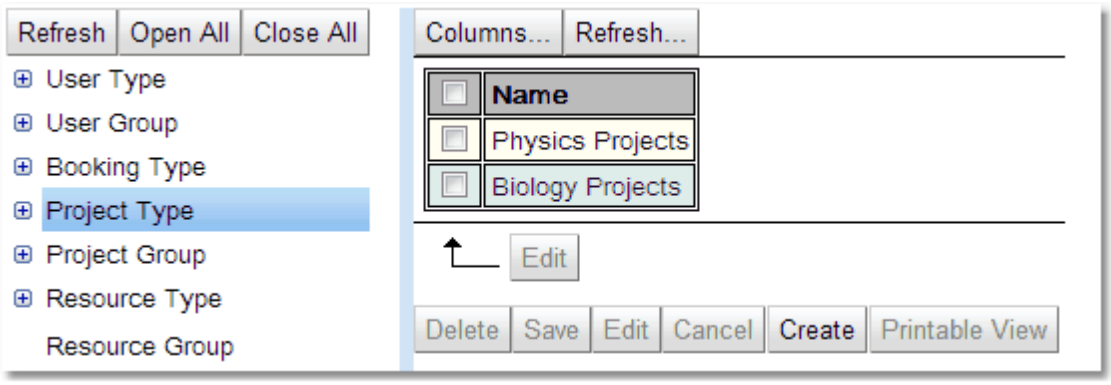
## The List View

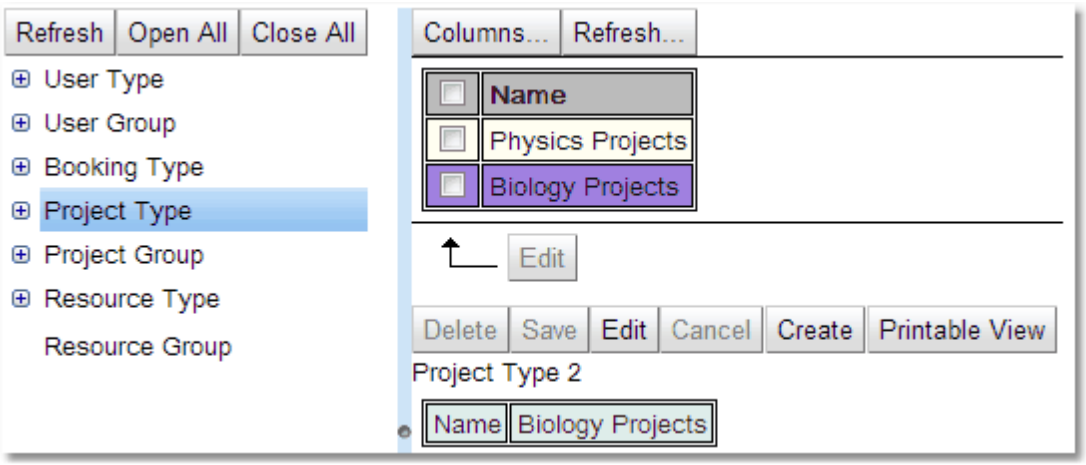
By clicking on one of the types or groups in the left hand pane, in the right hand pane will appear a list of all the entries for that type or group. This will include two menus, one above and one below the list.

For a complete description of the standard toolbar buttons read the Toolbar Button Standard Definition 15 chapter.




Many items can be edited in one go quite easily in the list view, using the check boxes read the section on How To Edit Multiple Items At Once 47 in the Data Explorer 46 chapter.

To edit an individual item from this list click on it and it will appear below the list and the edit functions allowed will no longer be greyed out.

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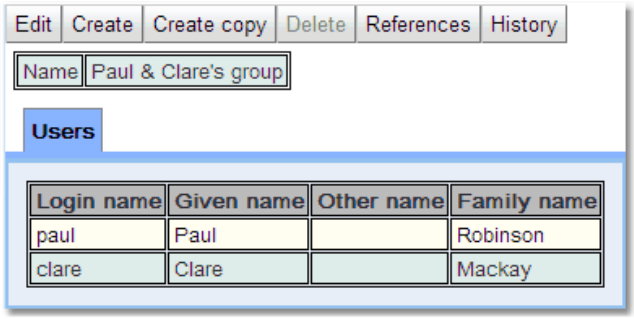
## The Item View

Once a group or type has been opened up in the left hand pane select individual items to work on. Once selected these items will appear in the right hand pane.

For a complete description of the standard toolbar buttons read the Toolbar Button Standard Definition[15] chapter.

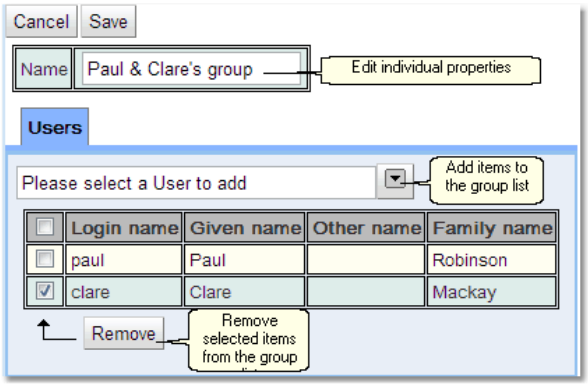
*Booking Type*[250]




*User Group*[252]

**Types and Groups** appear slightly differently, Types are just a list of the *properties*[252] that can be changed. A group has that list but also a list of all the appropriate items that are in its group. For instance a **User Group** will have a list of all the logins associated with that group.

Once in edit mode, edit any *properties* with *permission*[251] to access and add or delete items from group lists.




To remove items from the list first select the items to be removed using the check box and click the **Remove** button.
To add items to the list use the pull down to get a full list of possible items and select the one required.

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## 4.3 Permissions

*Permissions*[251] are designed to be very flexible, so that you have fine-grained control over who can perform what action on what data. This can be done by creating multiple *Permissions* objects. **Exprodo DB** looks at all the *Permissions* that apply to the action the user is trying to perform and uses them to work out if Permission should be granted or denied.

### 4.3.1 How Permissions Work

Some systems have a large master list of actions, and then for each role, there would be a tick against each of the actions that users with that role can do.

The problem with that kind of approach is that it is best employed when the system has a predefined set of actions that need to be controlled. However, **Exprodo DB** is designed to allow for precise control over the detail of what people are allowed to do. This means that it is much more flexible for a variety of situations. That flexibility also leads to a degree of complexity, but this section of the manual will try to make this topic as simple as possible.

*Permissions*[251] are not implemented with an all-encompassing list of actions. The method that is used is to define a small set of simple *actions*[251], and then create customised and highly targeted individual *Permissions* to control what can be done. The overall picture is then obtained by aggregating those individual *Permissions*.

That aggregation is possible due to a mechanism that allows layering of *Permissions*, where some *Permissions* can override others. The crucial element in allowing this is the concept that **Exprodo DB** supports both authorising *Permissions* that permit something to be done, and non-authorising *Permissions* that deny the right to do something.

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## Breaking An Activity Into Its Parts

Let's start by looking at an example, viewing the content of a *booking*[250].

This example is taken from **Calpendo**, an **Exprodo** application. The same principles apply to all **Exprodo** applications. To help with following this example, it is useful to know that **Calpendo** is a *booking* system with Booking Rules that specify who can make what *bookings*. Each *booking* may be associated with a *project*[251], and each *project* has a number of users. Each *booking* has a *resource*[252], which is the equipment, instrument, room or person etc. that is being booked.

This breaks down into the following items:

1. ***Action***

   Start by looking at the underlying *action*. Everything is broken down into an *action* of some sort, and the most common *actions* are create, read, update and delete. In the example, it is view, or read.

2. ***Biskit Type***[250]

   Next, look at the type of the data the *action* will affect. In the example in order to control viewing of the content of a *booking*, the *Biskit Type* is *booking*.

3. ***Property***[252]

   When trying to read or update something, as in the example, then the *action* has an impact on individual *properties*. That means the user may have *permission* to read some of the *properties* on the *booking*, but not all of them.

   So for some *Permissions*, it is necessary to define the *property* controlled by the *Permission*. For example, to grant or deny the ability to view a particular *property* on a booking, create a *Permission* that affects just that one *property*.

   *Permissions* that apply to individual *properties* are only relevant to reading and updating things. For example, when deleting something, the whole thing is deleted and not just individual *properties*. So it makes no sense to specify a *property* on a *Permission* that controls who can delete data.

## Layering Permissions

When defining *Permissions*, specify the *action* to be controlled and optionally the *Biskit Type* and *property*. *Permissions* that specify only the *action* are known as *action Permissions*. *Permissions* that specify the *action* and a *Biskit Type* are known as *Biskit Type Permissions*, and *Permissions* that specify *action, Biskit Type* and *property* are known as *property Permissions*.

In a typical system, everybody can read most things. So it is usually easier to start by giving read *Permission* to everybody to read everything. This can be done with an action *Permission* for the read action. Then, layered on top of that, create a non-authorising *Permission* that takes away *permission* for the things that are not allowed to be read.

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The layering works by using *action Permissions* only if there isn't a relevant *Biskit Type* or *property Permission*. Similarly, *Biskit Type Permissions* are used if there isn't a relevant *property Permission*.

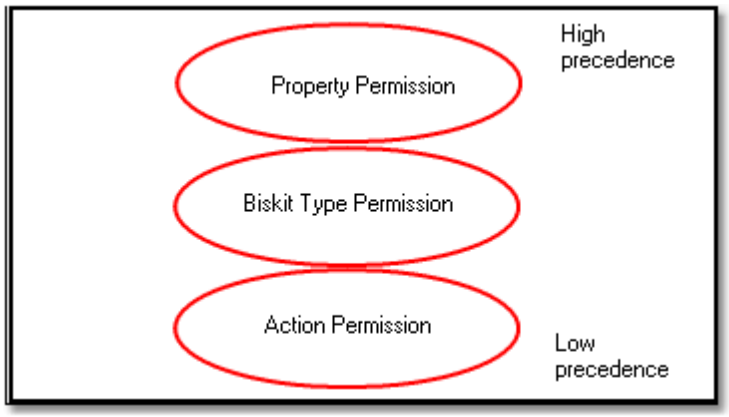
There is also a numerical priority that can be specified for each *Permission*, and that provides another way to layer *Permissions* because the highest priority *Permissions* within each of the three layers, *action*, *Biskit Type* and *property*, are considered first.

If a relevant *Permission* can not be found, then permission to perform the *action* is denied.

## Precedence Of Permissions

When sorting through the *Permissions* to decide which one to apply, **Exprodo DB** will only consider those that match the *action*, *Biskit Type*, *properties*, *conditions* 250 and that also target the user concerned. Also, note that those *Permissions* that do not specify a *Biskit Type* will also be considered.

Once that filtering has taken place, **Exprodo DB** will use *property Permissions* first, then *Biskit Type Permissions*, and finally *action Permissions*. Within each of those three, *Permissions* are further sorted by priority, and the *Permission* with the highest numerical value for its priority will be used. If there are multiple *Permissions* with the same priority, then it is undefined which one will be used. The reason this is required will become apparent after going through the way in which the *conditions* under which each *Permission* may be used can be specified.




*Precedence of permission types.*

When a *BiskitDef* has another *BiskitDef* as its parent it will have access to the *Permissions* created for the parent.
When checking *Permissions* all the child *Permissions* will be filtered and acted on. If there is not a relevant *Permission* then the parents *Permissions* will be filtered and acted on, for each type of *Permission* in order of precedence. For the action **Update** this will be done first using *property Permissions*, and then *BiskitDef Permissions* and finally the action **Update** *Permissions*. This means all *property Permissions* on the parent will be checked before any *BiskitDef Permissions* on the child will be checked.

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## Conditions

The *conditions* assigned to a *Permission* provide a means of very precise control over the situations in which a *Permission* will apply. For example, there may be different *Permissions* that apply depending on:

- the *resource* a *booking* is made for
- the *status* 250 of a *booking* (for example, a *booking* may be editable while it is a request, but not once it has been approved)

or a particular *Permission* is to apply when:

- approving a booking
- cancelling a booking

All of these things are specified by the *conditions*. Here are some examples. Suppose there are two *Permissions*, both of which apply to updating *bookings*, and both of which are *Biskit Type Permissions* (which means they specify the *action* and *Biskit Type* but not a *property*). *Permission* A has the *condition*:

- *status* equals **Requested**

and *Permission* B has the *condition*:

- *resource* equals **Wet Lab**

In this case, assuming both *Permissions* apply to the current user, then *Permission* A will apply whenever the user tries to update a *requested booking* 252 and *Permission* B will apply whenever the user tries to update a *booking* for the **Wet Lab** resource.

What happens when trying to update a *requested booking* for the **Wet Lab**. In that case, both *Permissions* could apply. This is where the *Permission* priority comes in. If one *Permission* has a higher priority than the other, then the highest priority *Permission* will be used. If they have the same priority, then either one could be used.

## Authorising And Non-authorising Permissions

When thinking about giving *permission* for something, one normally thinks in positive terms. That is, authorising *permission* for something. However, the layering used in **Exprodo DB** requires that there is also the notion of non-authorising *permissions* as well as authorising ones. That means that a *Permission* can be written that will grant the right to do something at one layer, and then have another *Permission* at another layer that will explicitly deny the right to do something.

For example, there may be an authorising action *Permission* that allows everybody to read everything, and then a non-authorising *property Permission* to deny the ability to read the *booking* price for some people.

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## Targeting Users

For each *Permission*, choose which users it will affect.

However, it's sometimes easier to say who a *Permission* shouldn't affect, or to say that it's everybody meeting some criteria, apart from those that meet some other criteria.

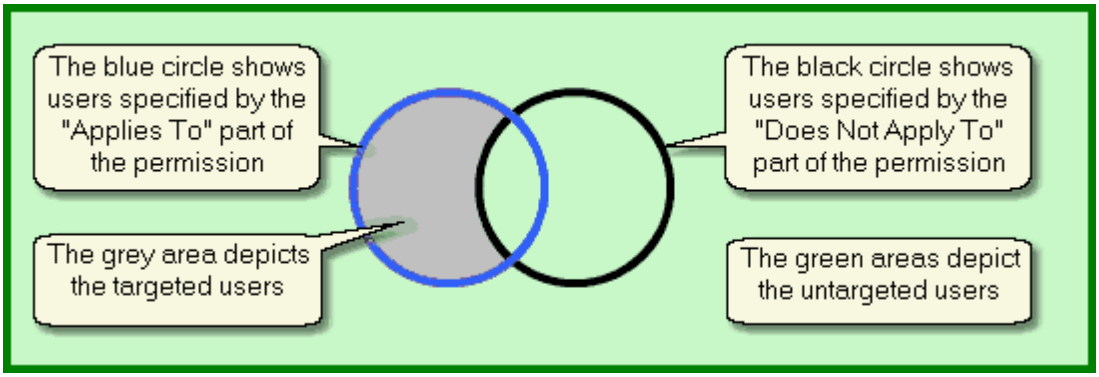
So **Exprodo** applications allows the specification of the users a *Permission* *applies to*[250] as well as those it *does not apply to*[250]. The affected users will be everybody the *Permission* applies to that are not amongst those it *does not apply to*.

Within each of the *applies to* and *does not apply to* sections, identify users by employing one or more of the following methods:

- Name individual users or *user groups*[252].
- Specify users by the *roles*[253] they have.
- Specify a property on the object being controlled that will identify a user or *user group.*

This last item, specifying a *property* that identifies a user or *user group*, needs more explanation. For example, a Calpendo *booking* has an *owner*[251] that is the user that owns the *booking*, a *booker*[250] that is the user that created the *booking* and a *project*. Each *project* also has an *owner* and users.

Consequently, when writing a *Permission* that affects a *booking*, users can be targeted by using any of the *properties owner*, *booker*, **project.owner** and **project.users**.


The blue circle shows users specified by the "Applies To" part of the permission
The black circle shows users specified by the "Does Not Apply To" part of the permission
The grey area depicts the targeted users
The green areas depict the untargeted users

*Showing the targeted and untargeted users, defined by the "Applies To" and "Does Not Apply To" users.*

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## Available Actions

The following table shows the available actions, and indicates whether each action uses *action*, *Biskit Type* or *property Permissions*:

| Action | Applies When You... | Uses Action Permissions | Uses Biskit Type Permissions | Uses Property Permissions |
|---|---|---|---|---|
| Create | Create a new object | X | X | X |
| Read | View an object | X | X | X |
| Update | Update an object | X | X | X |
| Delete | Delete an object | X | X | |
| Exists | Display a list of objects | X | X | |
| Email Readable | Include data in an email | X | X | X |
| Run Report | Run a report | X | X | |
| Dump Database | Take a backup of the whole database | X | | |
| Update Database Schema | Add or remove tables or columns in the database | X | | |

**Create**

When a new object is created, action and *Biskit Type Permissions* for the **Create** action are checked. The *property Permission* is checked to see if the *property* should be rendered read or read/write only by comparing against the default value of the *property*.

**Read, Exists and Email Readable**

When a user tries to view an object, **Exprodo** applications check whether the user has:

- **Exists** *permission* on the object to check whether the user is allowed to know that the object exists
- **Read** *permission* on each *property*, which means that *property* checks are performed on every *property* on the object.

The value of any *property* on which the user does not have **Read** *permission* will be hidden from the user.

When displaying a list of objects, **Exists** *permission* will be checked so that only those objects that the user is allowed to know exist will be seen. This also means that when generating a report that counts the number of objects matching some criteria, then the count will not include objects for which the user does not have **Exists** *permission*.

When sending an email, each object *property* that is to be included in the text is checked for both **Read** *permission* and **Email Readable** *permission*. Also, for every *property* inserted into the email, the object the *property* comes from is checked for **Exists** *permission*.

Emails may be read by anybody, and so when **Exprodo** applications check *permissions*

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for what can be included in an email, it checks whether the special user *nobody* 251 has the relevant *permission* as well as the user that performed the action that caused an email to
be sent. Therefore it is necessary to create a *Permission* that gives **Email Readable** *permissions* to user *nobody* for any information that is required to go into an email. See Special Users 70 for more details on user *nobody*.

**Update**

When a user tries to update an object, **Exprodo** applications will check for **Update** *permission* on the object and also on each *property*. If *permission* is denied for any *property*, then **Update** *permission* for the whole object is denied. This is different from viewing an object, where being denied *permission* to read one *property* does not stop the user from seeing the other *properties*.

When editing an object, if **Exprodo** applications can determine that *Permissions* prevent the user from changing a *property*, then that *property* will be rendered in an unmodifiable form. This will prevent the user from making changes that would only be rejected later.

**Delete**

When deleting an object, **Delete** *action* and *Biskit Type Permissions* are checked.

**Run Report**

**Run Report** *action Permissions* are checked whenever a report is run. This allows the administrator to prevent some types of report being run (for example, to stop some people from running summary or group reports), or the *Biskit Type* being reported on (for example, to restrict reports about system usage or other things).

To control which reports somebody can run, create a **Run Report** *action Permission* for the *Biskit Type* **Report**. Then place conditions on which reports can be run.

**Run Report** *Permissions* for any *Biskit Type* other than **Report** will be ignored.

**Dump Database**

**Dump Database** action *Permissions* are checked when trying to using the **Database Backup** page to generate a copy of all the data in the database.

**Update Database Schema**

Checked when using the *Bakery* 250 to modify the database schema for newly added dynamic *properties*.

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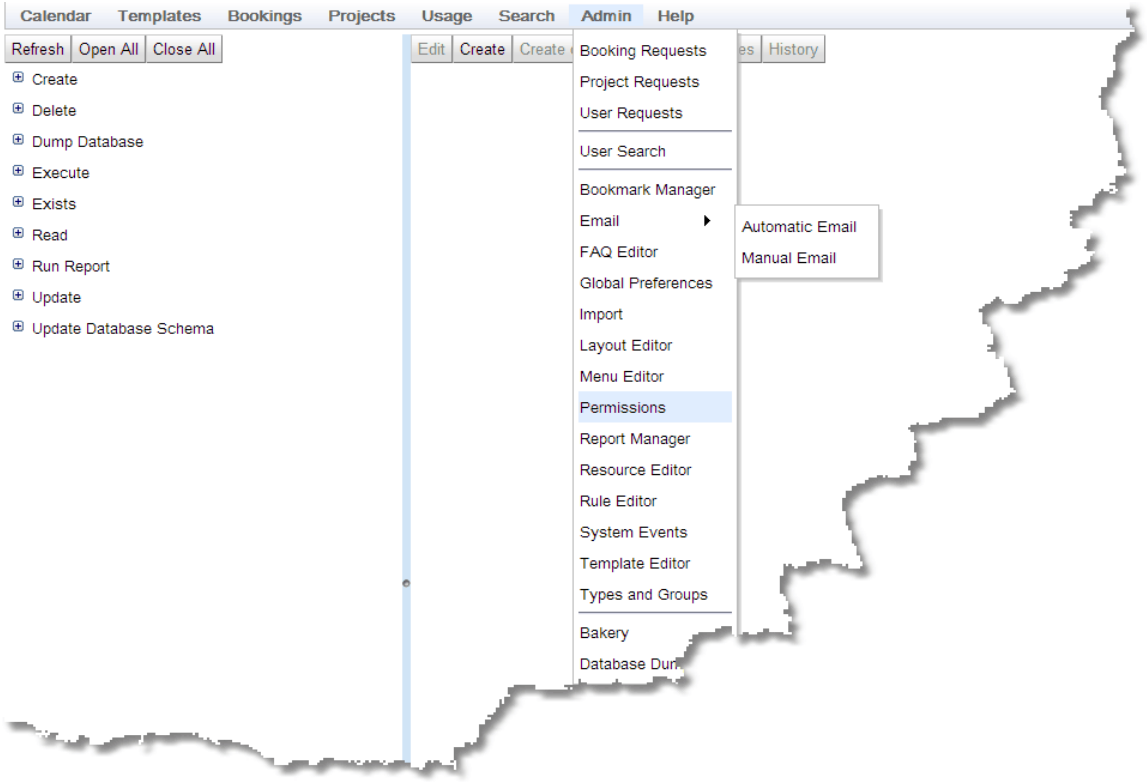
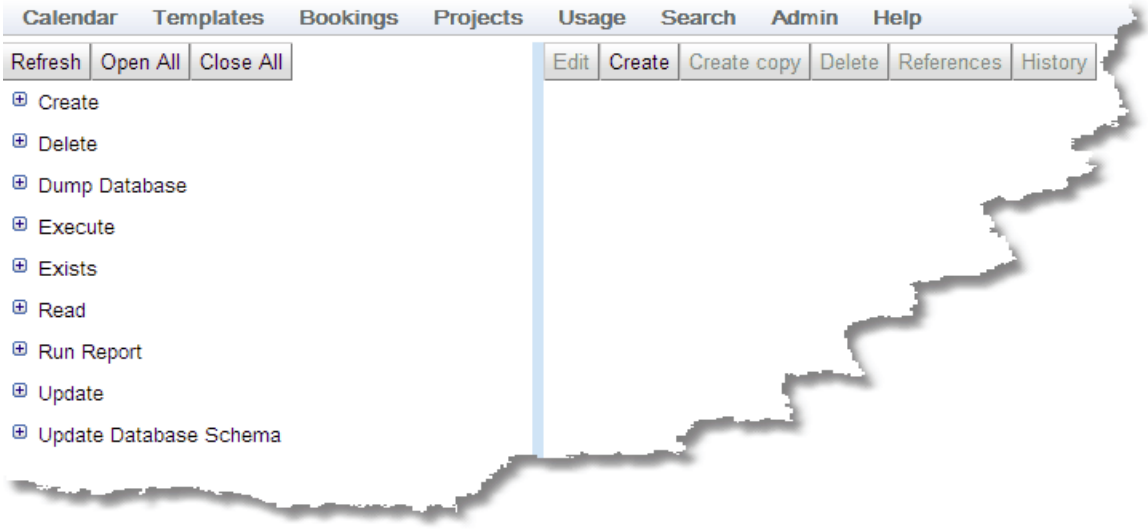
### 4.3.2 The Permissions Editor

The **Permissions Editor** shows all the *Permissions* 251 and allows the user to create, update and delete them. By default, it appears on the menu here:




This is what the **Permissions Editor** looks like first opened:

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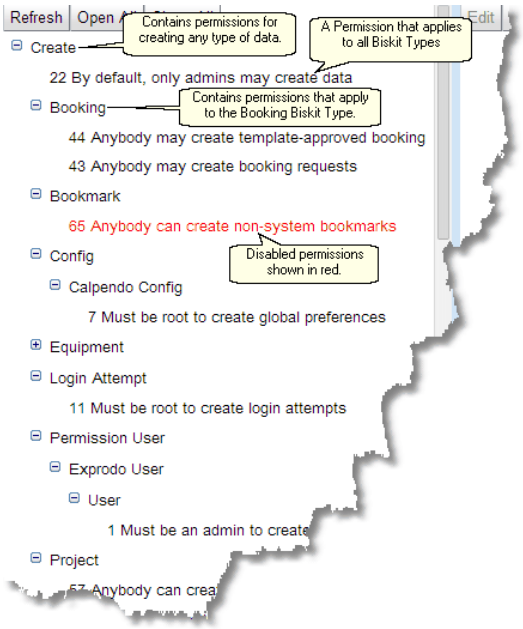
## The Tree Of Permissions

*Permissions* apply to a particular action[251] and *Biskit Type*[250]. The above screen shot shows all the *Biskit Types* for which there are *Permissions*. Note that a *Permission* can also be defined that will apply to any *Biskit Type*.

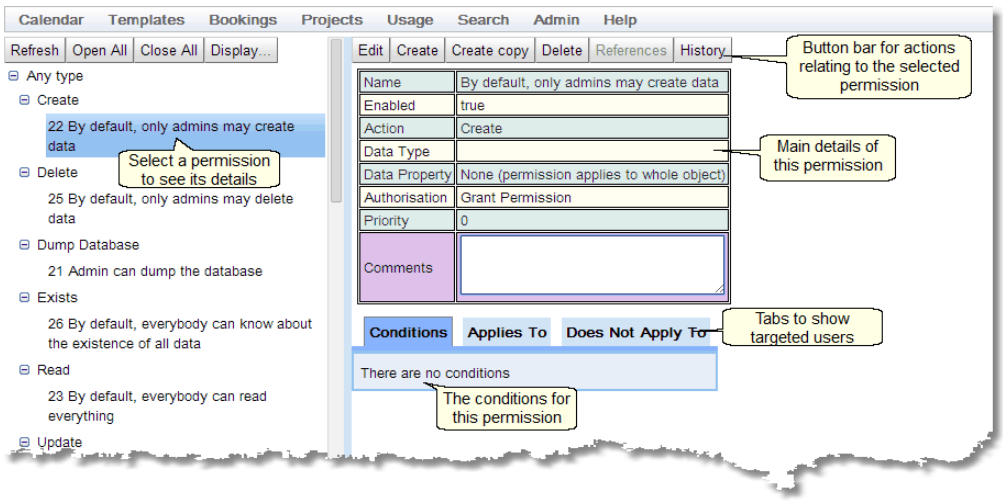
For a complete description of the standard toolbar buttons read the Toolbar Button Standard Definition[15] chapter.

Once all the items in the tree are viewable, the *Permissions* are viewable in their *Action*, *Biskit Type*, *Permission* categorisation with any that are disabled shown in red.


Refresh
Edit
Contains permissions for creating any type of data.
A Permission that applies to all Biskit Types
Create
22 By default, only admins may create data
Booking
Contains permissions that apply to the Booking Biskit Type.
44 Anybody may create template-approved booking
43 Anybody may create booking requests
Bookmark
65 Anybody can create non-system bookmarks
Config
Disabled permissions shown in red.
Calpendo Config
7 Must be root to create global preferences
Equipment
Login Attempt
11 Must be root to create login attempts
Permission User
Exprodo User
User
1 Must be an admin to create
Project

## Permission Detail

Click on a *Permission* in the tree, and the details for that *Permission* will appear on the right:

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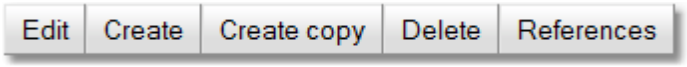
Now that a *Permission* is selected, the button bar is no longer greyed out:




For a complete description of the standard toolbar buttons read the Toolbar Button Standard Definition[15] chapter.

Press the **Edit** button to make the page to be editable, and the button bar changes:

The main details of the *Permission* contain all the information represented in the tree on the left. These two screen shots show the details in read-only and in edit mode:

| | |
|---|---|
| Name | By default, only admins may create data |
| Enabled | true |
| Action | Create |
| Data Type | |
| Data Property | None (permission applies to whole object) |
| Authorisation | Grant Permission |
| Priority | 0 |
| Comments | |

| | |
|---|---|
| Name | By default, only admins may c |
| Enabled | true |
| Action | Create |
| Data Type | Please select a Biskit Def |
| Data Property | Data type not set |
| Authorisation | Grant Permission |
| Priority | 0 |
| Comments | |

When changing these details:

- The **Name** can be as required, but should not be the same as any other *Permission*.
- The **Comments** can also contain anything and is only there to record whatever notes there are about the *Permission*.
- The **Enabled** flag is a way to create a *Permission* without making it take effect immediately, or to turn one off without deleting it. A disabled *Permission* shows in red in the tree.

The other *properties*[252] are described in How Permissions Work[97].

## The Conditions Tab

*Conditions*[250] underpin much of the configuration that can be done in **Exprodo DB**, and they are used in several places (most notably in *Automatic Emails*[116]). Consequently, they have their own section of this configuration guide. See Conditions[17] for the details.

Please note that the section that describes *conditions* indicates that the **Updated Value** and **Change** *condition* types are considered an error in some contexts. For *Permissions*, they are only usable when the *Permission action* is **Update**.

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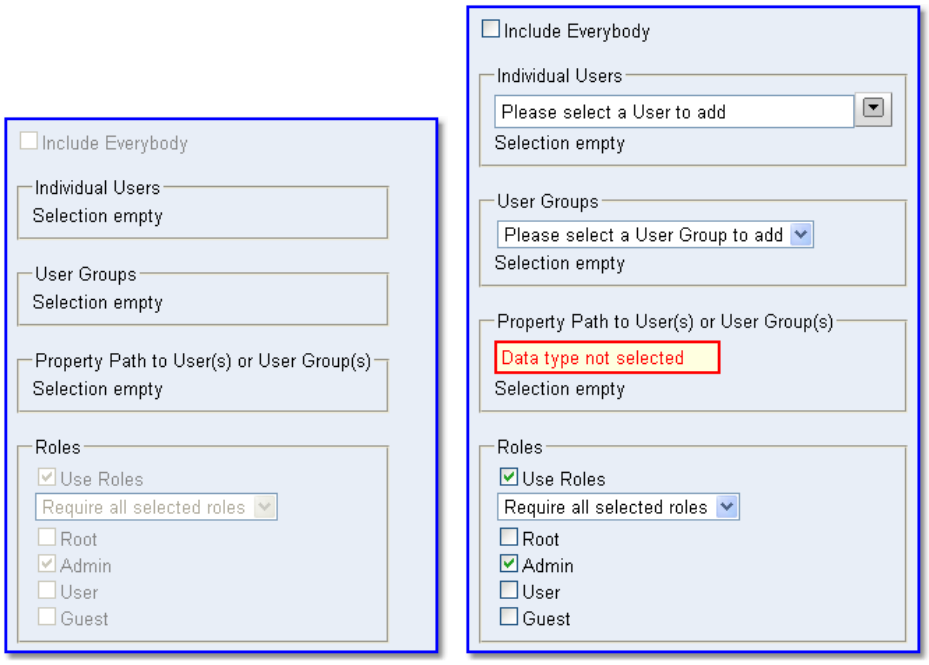
## The Applies To Tab

In read-only and editable mode, the **Applies To** tab looks like this:




### Include Everybody

If set to **true**, then this means that the *Permission* applies to all users, and so the rest of the tab is hidden. As described in Introduction To Permissions [97], the targeted users are those users covered by the **Applies To** tab that are not also covered by the **Does Not Apply To** tab.

### Individual Users

This allows the specification of particular users that the *Permission* should apply to.

### User Groups

The *Permission* will apply to.any user in the specified *groups* [252].

### Property Path

A *Permission* *property path* [252] works exactly the same as the property path [121] in an Automatic Email [116], and it is described more fully in that section. The *property path* is a *property* or list of *properties* that lead from the *Biskit Type* defined on the *Permission* to a user or *user group*, and those users will also have the *Permission* applied to them.

### User Roles

Users can have multiple *roles* [253]. Any number of *roles* can be selected by ticking the check box next to the *role*, and then choose with the drop-down whether the *Permission* is to apply to users that have *all* of the selected *roles*, or users that have any of the selected *roles*.

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## The Does Not Apply To Tab

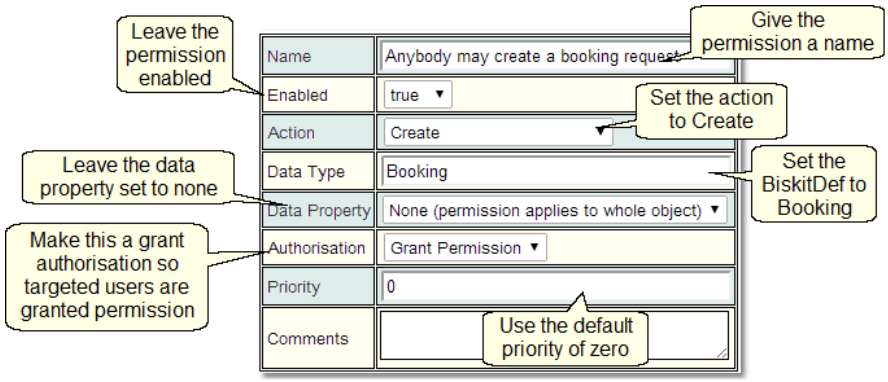
This tab is almost identical to the **Applies To** tab. The only difference is that the check box at the start is labelled **Exclude Nobody** instead of **Include Everybody**. When ticked, it means that no users are taken away from the *Applies To*[250] list of users, and so the rest of the **Does Not Apply To** tab will be hidden. When unticked, the users that should not be targeted are selected.

### 4.3.3 Example Permissions

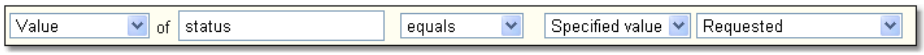
## Example 1: Anybody May Create A Booking Request

A *booking*[250] is a **Calpendo** object that has a *status*[250], start and finish date and a few other *properties*[252]. This example will create a *Permission*[251] that authorises anybody to create a *booking* when the *booking* to be created has its status set to **Requested**. Note that by creating a *Permission* like this, it doesn't influence what happens when somebody tries to create a *booking* whose *status* is set to something other than **Requested**.

1. Create a *Permission* that applies when a *booking* is **Created** and give it a name




2. Add a *condition*[250]: **Status** is **Requested**




3. Under **Applies To**[250], ensure **Include Everybody** is ticked

4. Under **Does Not Apply To**[250], ensure **Exclude Nobody** is ticked

5. Save the *Permission*.

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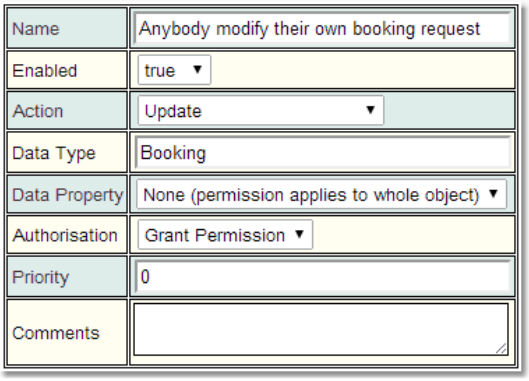
## Example 2: Anybody Can Modify A Booking Request They Created If The Booking Is Still A Request

This example shows the difference between using a **Old Value** condition and an **New Value** condition. We need a *Permission* that will allow somebody to modify a *booking* if they created it and the status was set to **Requested** before they tried to change it, and its value would still be **Requested** after the change.

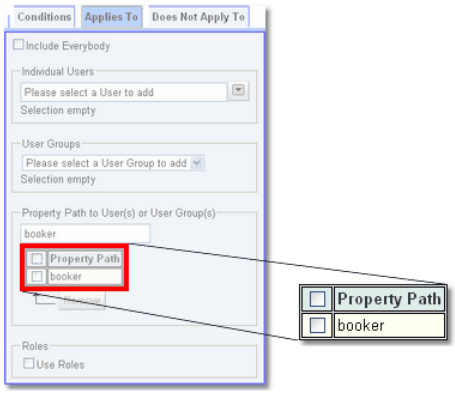
1. Create a *Permission* that applies when a *booking* is **Updated** and give it a name:




2. Add a *condition*: **Status** is **Requested**. Note that for an update, to put a *condition* on the value after the update, then use a **New Value** type of *Condition*.

3. Add a *condition*: **Status** was **Requested**. Here, we use a **Old Value** type of *Condition* to put a *condition* on the value that the status had before the update.

4. We now need to limit the *Permission* to applying to whomever created the *booking*. This is easy because each *booking* stores a record of who booked it in the *booker*[250] *property*. To do this, go to the **Applies To** tab, untick **Include Everybody** and then add a *property* path to *booker*.




5. Save the *Permission*.

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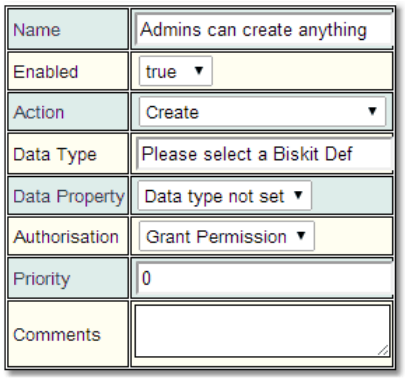
## Example 3: Admins May Create Or Update Anything

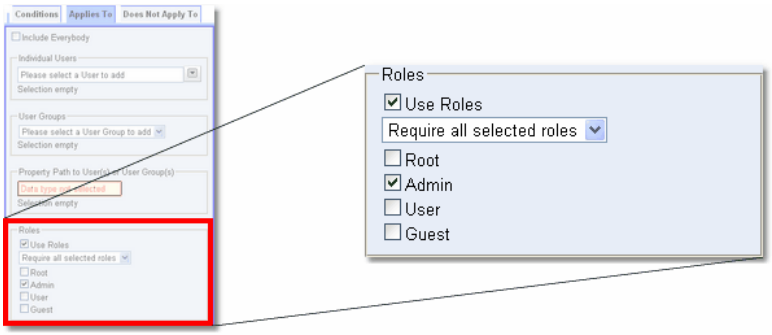
This example shows how to use User Roles to decide who gets *permission* to do something, as well as showing how to create a *Permission* that applies to every *Biskit Type*[250]. Use a *Permission* like this when the Admin Role needs to bestow the ability to create or update whatever they like. The *Permission* can still be revoked in some circumstances by using a *Permission* of a higher level elsewhere that overrides the *Permission* we're creating here.

To achieve the ability to let the administrator create or update anything, we need to create two separate *Permissions*, one for the **Create** and one for the **Update**.

1. Create a *Permission* that applies when **Anything** is **Created** and give it a suitable name. Leave all the other options at their default values:




2. Under **Applies To**, untick **Include Everybody**, select **Use Roles** and tick the check box next to **Admin**




3. Save the *Permission*.

4. Repeat step 1, but this time set the *Action*[251] to **Update** and set the *Permission's* name accordingly.

5. Repeat of steps 2 and 3 above for this **Update Permission**.

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## Example 4: Only Allow Specified Users To See The Price Being Charged For Use Of A Resource

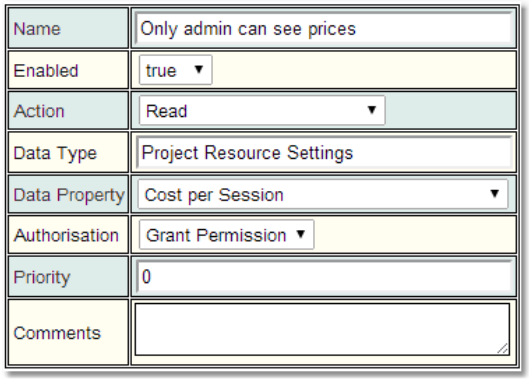
In **Calpendo**, a *resource* 252 represents a real-world item that can be booked. The price to be charged for its use is *project* 251 specific, and stored in the **Cost Per Session** *property* of a *Project Resource Setting* 251. This example is therefore designed to stop anybody apart from one particular administrator being able to view this price.This serves to demonstrate how to protect individual *properties* and how to apply Permissions to individuals. This is known as a Property Level Permission 98.

There are two ways we can set up *Permissions* to achieve the result we want, depending on what we'd like to achieve. We can create a *Permission* for each methodology:

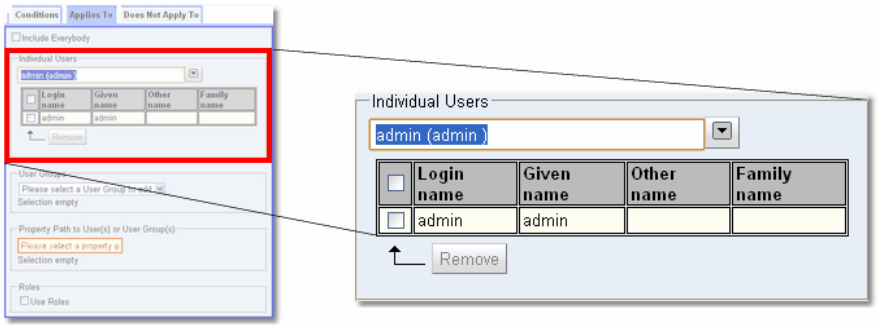
- Authorise the user **Admin** to read the the **Cost Per Session**, but say nothing about whether other users can read it.
- Deny everyone other than the user **Admin** from being able to read the **Cost Per Session**, but say nothing about whether **Admin** can read it.

When a *Permission* says nothing about whether a user is granted or denied *permission*, then you rely on other *Permissions* to specify what you want. This is the way that multiple *Permissions are* superimpose to get the result required. To show how this works, we'll go through each of the options above in turn.

1. Create a *Permission* that applies when a *Project Resource Setting* is **Read** and set the **Data Property** to **Cost Per Session**




2. On the **Applies To** tab, untick **Include Everybody** and under **Individual Users**, select one or more users. In this example, a user called **Admin** has been added.

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3. Save the *Permission* as it is, and with the default values of **Authorisation** being **Grant Permission,** it means that the targeted users (in this case, the user **Admin**) will be granted *permission* when trying to view the **Cost Per Session**. This *Permission* says nothing about whether other users can read **Cost Per Session**.

If you now wanted to change the *Permission* so that it says nothing about whether **Admin** can read **Cost Per Session**, but that it denied *permission* for all other users, follow the following steps:

4. Press the **Edit** button (unless you didn't actually save it and so it's still shown in an editable form).

5. On the **AppliesTo** tab, tick **Include Everybody**.

6. On the **Doesn't Apply To tab**, untick **Exclude Nobody** and add **Admin** to the list of individual users.

7. In the main *Permission* details, change **Authorisation** to **Deny Permission**.

What we've now done is to target everybody apart from **Admin**. We've made the *Permission* negative, so that the targeted users will be denied permission to read **Cost Per Session**.

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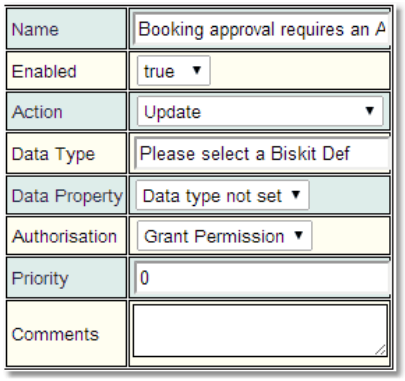
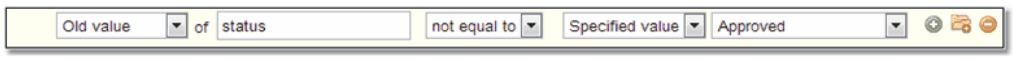
## Example 5: Approval Of A Booking Requires An Admin

In this example, we are going to create a *Permission* that allows anybody with the Admin Role to change a *booking's status*[250] to **Approved.** We will also add a *condition* to make sure we're matching the situation where an administrator modifies the *status* themselves, rather than where the *status* is modified indirectly as a result of moving the *booking* to a period in which a *Time Template*[252] (another **Calpendo** concept - the details of which are not important here) has approved the *booking*.

1. Create a *Permission* that applies when a *booking* is **Updated**, give it a name, and make it **Grant Permission**.




2. Add a *condition*: **Old value Status** was not **Approved**




3. Add a *condition*: **New value Status** is **Approved**

4. Add a *condition*: **New value templateApproved** is **false**. The **templateApproved** *property* is set automatically when a *booking* is approved by a *Time Template* and so we can use it to detect how the status was changed.

5. Under **Applies To**, untick **Include Everybody**, select **Use Roles** and then add **Admin**.

6. Save the *Permission*.

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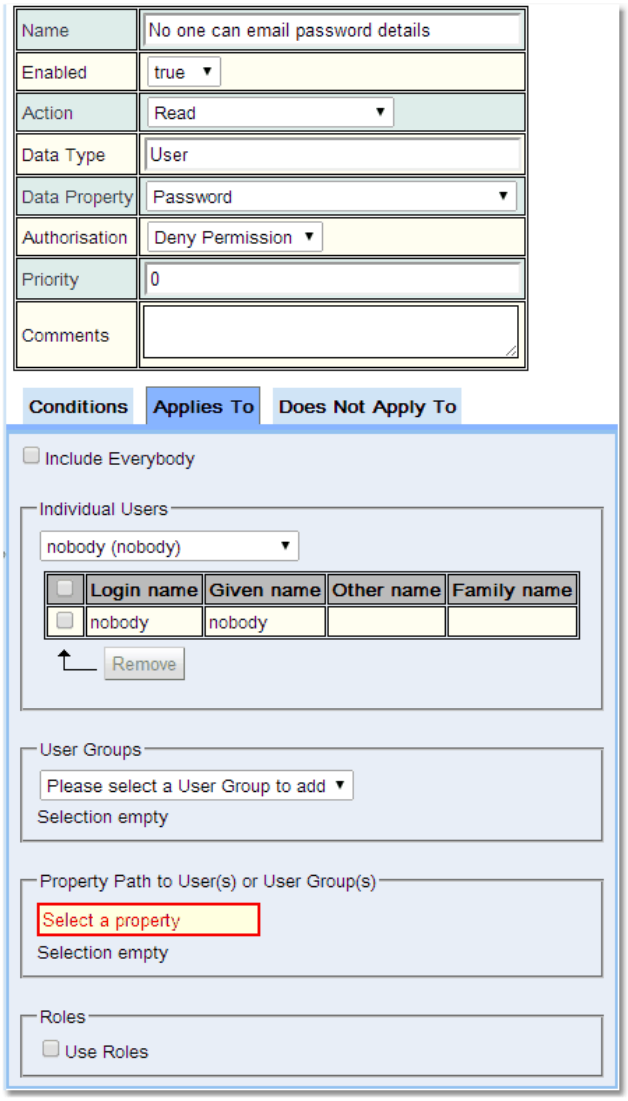
## Example 6: No One Can Email Password Details

In this example, we are going to create a *Permission* that stops everybody from putting the value of the password property of the **User** *Biskit Type* into an email. To do this we will be using the special user *nobody*[251]

1. Create a *Permission* that applies when a **User** is **Read**, give it a name, select the *property* **Password**, make it negative (**Authorisation** is **Deny Permission**).




2. Under **Applies To**, untick **Include Everybody**, select **Individual Users** and then *nobody*.

3. Save the *Permission*.

Use this mechanism on any information you do not want sent by e-mail.

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## Example 7: Hiding Resources And Booking Properties

Sometimes the administrator may want to create *resources* that only some people may access, or define *properties* on a *booking* that some people shouldn't be allowed to see. This is achieved by setting up *permissions* that control who can access what.

To hide some *bookings* from some people:

- Deny them READ *permission* on the *bookings* they should not be able to see.

If you want to hide a *booking property* from some people, then:

- Create a property-level Booking *permission* that denies them READ rights on that *property*
- Create a separate *permission* for each *property* you need to hide

If you want to hide a *resource* from someone, here is the list of *Permissions* that need to be set up:

- Deny them EXISTS *permission* on the *resource*
- Deny them READ *permission* on *bookings* for that *resource*
- Deny them READ *permission* on *templates* for that *resource*.

To set up the first permission.

| | |
|---|---|
| Action | Exists |
| Data Type | Resource |
| Condition | Value of self equals Specified value (name of resource) |

**Self** is *property* of type *Biskit* that points to the *Biskit* owning the *property*. By using the **self** *property* rather than the **name** *property* the primary key of the *Biskit* is stored in the *Condition* and not the name, therefore if the name changes the *Permission* will still work.

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## 4.4 Automatic Emails

**Exprodo DB** can send emails automatically, in response to any data being created, updated or deleted. An **Automatic Email** is a specification for the conditions that should generate emails, to whom they should be sent, and what the content of those emails should be. So every time any data is created, updated or deleted, **Exprodo DB** checks to see if there is an **Automatic Email** that matches the data that was created, updated or deleted. The **Automatic Email** doesn't just specify fixed content that should be sent in the email, but rather, it specifies a template so that *properties* 252 from the changed data can be included.

When creating an **Automatic Email**, these are the elements set:

- A **Name**, to can distinguish it from other **Automatic Emails**.
- The *Biskit Type* 250 of the data that must change for the **Automatic Email** to trigger.
- The type of change the data must undergo. That is, **Create**, **Update** or **Delete**.
- Optionally, specify *conditions* 250 that are tested against the changed data.
- Specify the recipients of the email. Do so by specifying:
    1. Individual Users
        a. For occasions when the *Biskit Type* being changed is a **User**, *User Type* 253 or *User Group* 252, then that user (or set of users) may be required to receive an email. For example, if an administrator changes a user's status to **Blocked**, then set up an **Automatic Email** that sends the blocked user an email telling them they've been blocked.
        b. The user that caused the original data change should receive the email. For example, when a user creates a *project* 251, send them an email to confirm its creation.
    2. Individual *user types*
    3. Individual *user groups*
    4. The *roles* 253 that a user should have, for example to send the email to all users with the **Admin** *role*.
    5. A path to a custom *property* storing users, *user types*, *user groups* or email addresses. This gives the ability to send emails to users outside the **Exprodo DB**.
- Specify the subject of the email. This can contain *properties* from the changed data.
- Specify the content of the email. This can contain *properties* from the changed data.

There is a flag to be set on the ***A*utomatic Email** to choose whether it is enabled or not. This allows the creation of **Automatic Emails** that are not always in use, and therefore can be turned on or off as required.

***See Also:***

Conditions 17 - these are central to the way **Exprodo DB** works and **Automatic Emails** in particular.

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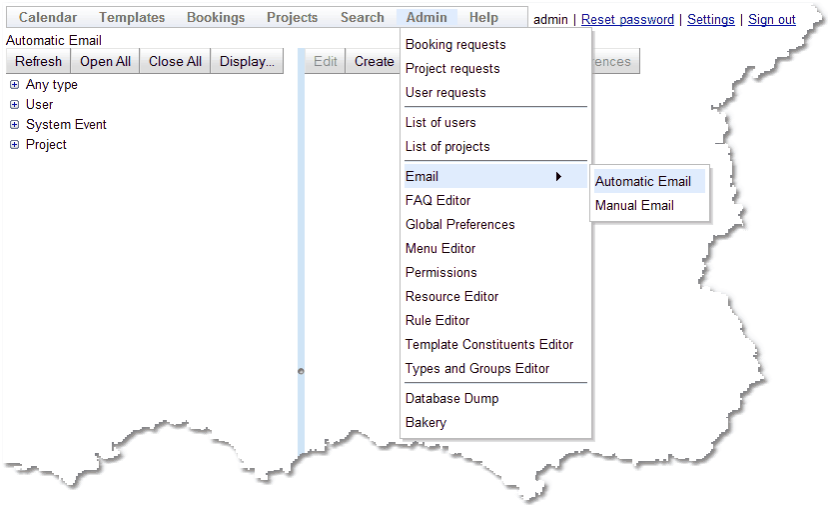
### 4.4.1 The Automatic Email Editor

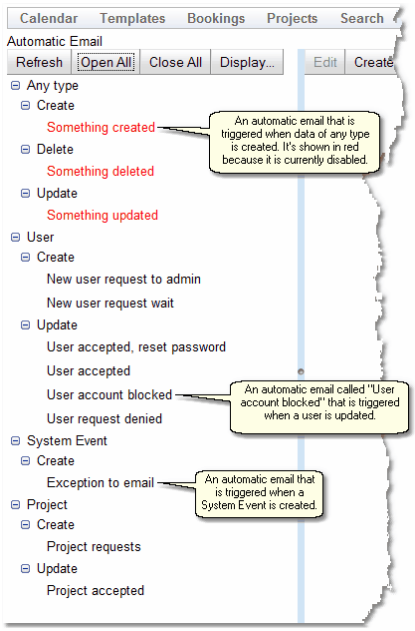
The **Automatic Email Editor** shows all the **Automatic Emails** and allows creating, updating and deleting them. By default, it appears on the menu here:




## The Tree Of Automatic Emails

**Automatic Emails** are triggered when data of a particular *Biskit Type* [250] is created, updated or deleted. Each **Automatic Email** defines which *Biskit Type* triggers it and which action (created, updated or deleted) triggers it. This means all the **Automatic Emails** can be categorised by *Biskit Type* and action. The above screen shot shows all the *Biskit Types* for which there are **Automatic Emails**. Note that an **Automatic Email** can be defined that will trigger for any *Biskit Type*.

For a complete description of the standard toolbar buttons read the Toolbar Button Standard Definition [15] chapter.




Once all the items in the tree are viewable, the emails in their *Biskit Type*, **Action**, **Automatic Email** categorisation will be seen, with any that are disabled shown in red. The tree shown here shows fourteen **Automatic Emails**, four of which are disabled and so are shown in red.

The first one shown under User, called **New user request to admin**, is an **Automatic Email** that is triggered when a user is created.

This doesn't mean that an email will actually be sent, because the **Automatic Email** may have *conditions* [250] that need to be checked. In this case, it has a *condition* that checks

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whether the *user's status* 253 is **Requested**, although you can't tell that without clicking on the **Automatic Email** to see its details.

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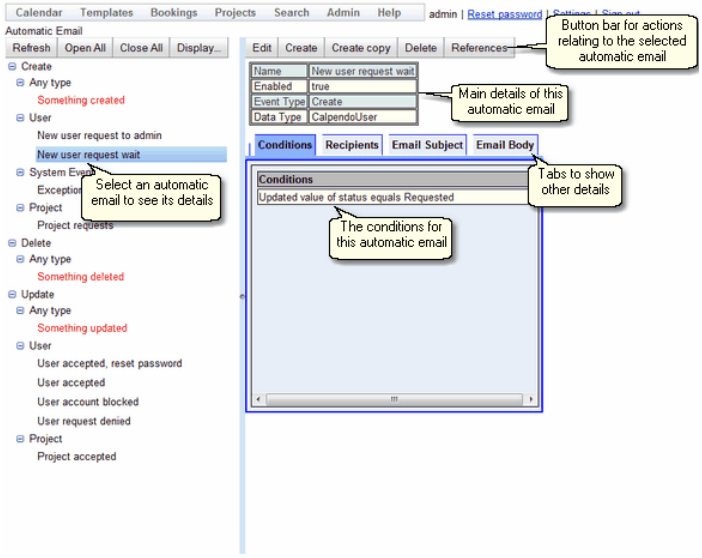
## Automatic Email Details

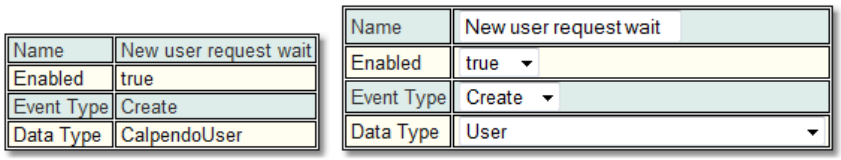
Click on an **Automatic Email** in the tree, and see its details appear on the right:


Button bar for actions relating to the selected automatic email
Main details of this automatic email
Select an automatic email to see its details
Tabs to show other details
The conditions for this automatic email

For a complete description of the standard toolbar buttons read the Toolbar Button Standard Definition[15] chapter.

Press the **Edit** button to make the page editable, and the button bar changes:

The main details of the **Automatic Email** contain all the information represented in the tree on the left. These two screen shots show the details in read-only and in edit mode:




When changing these details:

- The **Name** can be anything you like, but must be unique amongst **Automatic Emails**.
- The **Enabled** flag is a way to create an **Automatic Email** without making it take effect immediately, or to turn one off without deleting it. These show in red in the tree.
- The **Event Type** is where it is specified whether the **Automatic Email** is triggered by a ***Create***, **Update** or **Delete**.
- The *Data Type* value indicates which *Biskit Type* triggers the email. Choose the **Any data type** option to make the **Automatic Email** trigger for every *Biskit Type*. However, this does quite severely limit what Conditions[17] you can use and what "magic text" can be inserted into the email (described below).

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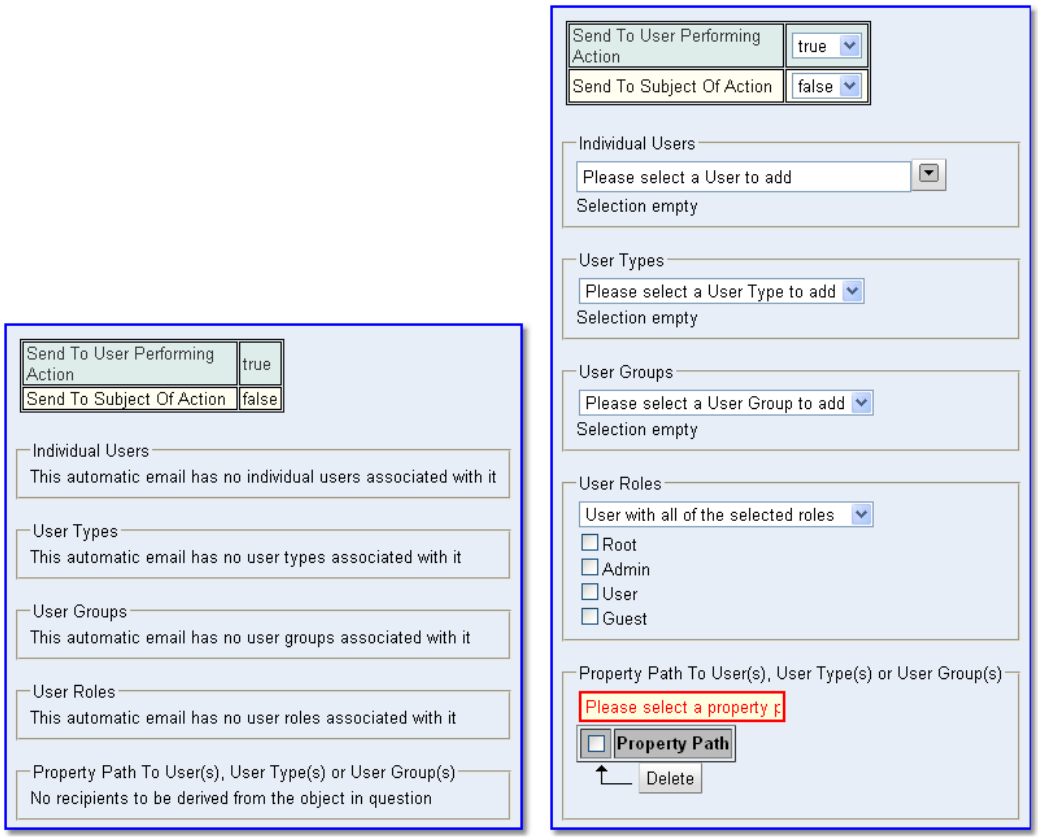
## The Conditions Tab

*Conditions* underpin much of the configuration that can be done in **Exprodo DB**, and they are used in several places (most notably in **Automatic Emails** and Permissions)[97]. Consequently, they have their own section of this configuration guide. See Conditions[17] for the details.

Please note that the section that describes *conditions* indicates that the **Updated Value** *condition* type is considered an error in some contexts. When the **Automatic Email** is triggered by a **Create** or **Delete** action, that is an example of **Updated Value** being inappropriate.

## The Recipients Tab

In read-only and editable mode, the **Recipients** tab looks like this:


Send To User Performing Action
true
Send To Subject Of Action
false
Individual Users
This automatic email has no individual users associated with it
User Types
This automatic email has no user types associated with it
User Groups
This automatic email has no user groups associated with it
User Roles
This automatic email has no user roles associated with it
Property Path To User(s), User Type(s) or User Group(s)
No recipients to be derived from the object in question
Send To User Performing Action
true
Send To Subject Of Action
false
Individual Users
Please select a User to add
Selection empty
User Types
Please select a User Type to add
Selection empty
User Groups
Please select a User Group to add
Selection empty
User Roles
User with all of the selected roles
Root
Admin
User
Guest
Property Path To User(s), User Type(s) or User Group(s)
Please select a property p
Property Path
Delete

### Send To Subject Of Action

This option is only applicable when the data whose change triggered the Automatic Email is itself a **User**, *User Group*[252] or *User Type*[253]. When setting this option to **true**, and triggered by a change to a **User**, then the changed user will receive an email. This means that when a **User** is modified (for example to change their *status*[253]), they can receive an **Automatic Email**. Similarly, if a *User Group* or *User Type* changes, then send an email to everybody in that *User Group* or with that *User Type*.

### Send To User Performing Action

An **Automatic Email** is triggered when some data is changed. Normally (but not always), that

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change is triggered by something a particular user did. If that user is required to receive the email, then select **true** for **Send To User Performing Action**.

### Individual Users

This lets you specify particular users that should receive the email.

### User Types

If you specify one or more *User Types*, then any user with one of those *User Types* will receive the email.

### User Groups

Any user in the specified *groups* will receive the email.

### User Roles

Users can have multiple *roles*[253]. Select any number of *roles* by ticking the check box next to the *role*, and then choose with the drop-down whether the email is to go to users that have all of the selected *roles*, or users that have any of the selected *roles*.

### Property Path

As an abstract concept, the *property path*[252] may at first appear confusing. It is used when the data that is changed contains a reference to a **User**, *User Group* or *User Type*, or else contains a *reference*[252] to something that contains a *reference* to a **User**, *User Group* or *User Type*. For example, a *System Event*[252] is a record of various things that happen. Every time a user logs in, a *System Event* is created. *System Event* has a *property*[252] called user that records who caused the event. If you were to create an **Automatic Email** that was triggered by a *System Event*, then direct the email to the user that caused that event by choosing a *property path* of **user**.

Custom *properties* can also be used which hold email addresses, this allows **Exprodo DB** to send emails to users outside **Exprodo DB**, by choosing such a *property* the **Automatic Email** would extract the email address.

Once the *Biskit Type* is selected that the **Automatic Email** is triggered by, then clicking in the *Property Path* selector will show a drop-down panel with all the possible paths that lead to a **User,** *User Group, UserType* or **Email property**.

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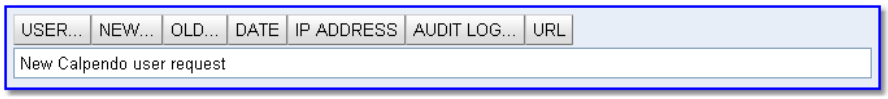
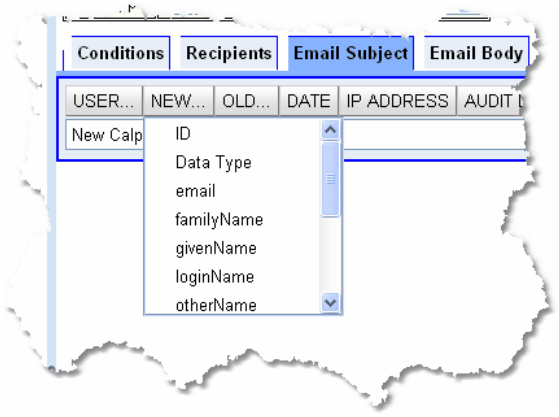
## The Email Subject Tab

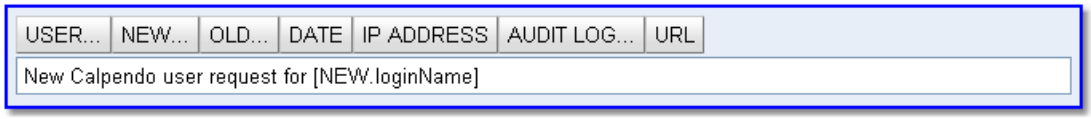
In write mode, the email **Subject** tab looks like this:




In the case shown, the email would have a subject of **New Exprodo DB user request**. The buttons that appear in the tab enable dynamic text to be inserted that will be replaced when the email is generated. For example, suppose the email subject is required to be **New Exprodo DB user request for X** where X should be replaced by the login name of the new user. To do this, first append the text "for " to the subject, making sure to leave the cursor at the point where the dynamic text is required to appear. Then press the **New Value...** button and select the user's login name from the drop-down:




And this would insert text into subject so that it looks like this:




The text inserted could have been typed in manually if it was known what to type. The buttons provide easy ways to enter the right **magic** text. When the **Automatic Email** is saved, the email **Subject** tab changes its appearance to look like this:

Once saved, the **magic** text parts are parsed and rendered differently, in this case in blue and bold. This gives some visual feedback so that it can be seen that the text has been recognised correctly. This is particularly useful if **magic** text has been manually typed in, rather than using the buttons.

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### The User... Button

The **User...** button inserts text that is replaced by the user that performed the action that led to the **Automatic Email** being triggered. If an administrator were to create a new **User**, then the **User...** button would insert details about the administrator and not the newly created **User**. If somebody registers themselves with **Exprodo DB**, then the **User...** button would insert details about the new user, since they instigated the event that generated the email.

### The New Value... And Old Value... Buttons

If a *Biskit Type* of **Any data type** has been selected for this Automatic Email, then these buttons cannot be used. When a specific *Biskit Type* is selected, then these buttons generate a pop-up with *properties* that belong to that *Biskit Type*.

This means that they allow the insertion of text from the object that was created, updated or deleted. In the case of an update triggering the email, then the **New Value...** button is linked to the *properties* on the object after the change has taken place and the **Old Value...** button is linked to the *properties* on the object before the change took place.

For date *properties* extract just the date or just the time to give more control over the content of the subject.

The example above is a special case: since the **Automatic Email** is triggered by a **User** changing, then this means that the **New Value...** and **Old Value...** buttons show the *properties* of a ***User***, just like the **User...** button.

When the action triggering the email is either **Create** or **Delete**, then the text inserted by the **New Value...** and ***Old Value...*** buttons will generate identical results.

### The Date Button

This inserts the text **[DATE]** and when the email is generated, this inserts the date and time that the email is generated.

### The IP Address Button

This inserts the text **[IP ADDRESS]** and generates the network IP address of the user that generated the change. For changes initiated by the **Exprodo DB** server, rather than a particular person, this will show the server's loopback network address.

### The AuditLog... Button

Whenever data is created, updated or deleted, there is an **AuditLog** entry created. This button allows the extraction of information from the audit log entry. This is not normally useful, but is required for a special case. When a user registers, there is normally an **Automatic Email** that lets an administrator know that a user has just registered. That email contains two **URLs** - one that will automatically approve the user, and one that will automatically deny the user. For this to work, **Exprodo DB** needs to make sure that when the relevant **URLs** are accessed, nobody else has already changed the user's *properties*. So, the **Automatic Email** uses the audit log information to add the ***AuditLog's*** identifier. This is a unique identifier for the audit log entry. **Exprodo DB** can then examine the audit log and check to see if there have been any changes to the user since the time the email was generated; only if there have been no subsequent changes will the user be approved or denied.

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### The *URL* Button

This inserts a **URL** to your **Exprodo DB**. Sometimes, it is required to provide a link in an email to a particular page. This can be done by putting the relevant page information after the main **URL**. For example, if a *Project*[251] has been changed, then set up a link like this: **[URL]/#ba&type=Project&action=view&id=[NEW.id]**

In this case, **[URL]** is replaced by the main **URL**, then **#ba&type=Project&action=view** links to a page that is told to display *Projects* and not other *Biskit types*. Finally, the **&id=[NEW.id]** specifies the identifier of the particular *Project* that was changed.

The easy way to work out how any URL like this should be formatted is to first go to the relevant page and see what URL **Exprodo DB** uses, then replicate that within the **Automatic Email**, replacing parts as appropriate with dynamic text.

It should be noted that it's not normally useful to insert a **URL** into an email's subject. However, the same **URL...** button is also used for the content of an email (as discussed in the next section).

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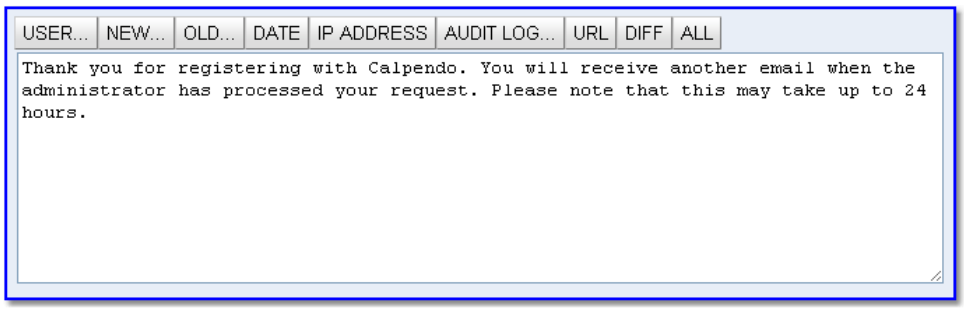
## The Email Body Tab

The body of the email works just like the subject does. The only differences are that there are extra buttons, for additional **magic** text, and the editor allows multi-line text instead of single-line text. In write mode, it looks like this:




The extra two buttons, **DIFF** and **ALL** generate a large amount of data. When triggered by an update, **DIFF** inserts text that is converted to something that shows what changed. **ALL** generates output that shows every piece of data from the changed *Biskit*[250], both before and after the change. This can be particularly noisy. The information it shows is normally everything that can be reached from the **New Value...** and **Old Value..** buttons. The exception to this is that if the **Automatic Email** is triggered by any *Biskit Type*, then the **New Value...** and **Old Value..** buttons cannot display appropriate *properties* because it doesn't know what *Biskit Type* will trigger the email. You also cannot type in something like **[NEW.name]** and hope that it will work, because it will not. In those cases, **[ALL]** is the only way to get at the details. The format this generates is not particularly user-friendly, and so if you use this, you should be careful about who receives such emails.

In order for any data to be included in an email it needs to have **Read** and **Email Readable** *Permissions*[251] set for the special user *nobody*[251]. By default there are no **Email Readable** *Permissions* set up, so no data can be sent by email. In order to allow data to be sent by email go to Permissions[97] and create an **Email Readeable** *Permission* for the user *nobody*.

## Dealing With Sensitive Data In Emails

If there is data that any user shouldn't be able to put into an email because of confidentiality or sensitivity but the user still needs to be able to access the information in **Exprodo DB** then set up specific *Permissions* for data. There is a special user called *nobody* which is used for this purpose. In the **Permissions** page, for a *property* or *Biskit,* create a *Permission* with *Action* set to **Read, E-Mail**, **Readable** or **Exists**, **Positive** to **False** and *Applies To*[250] to *nobody*, so that the *property* or *Biskit* can still be accessed and read by the user within **Exprodo DB** but cannot be added to an email. Read the Permissions[97] section for more details on setting *Permissions*.

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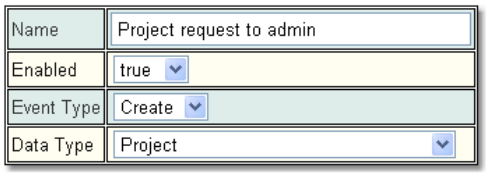
### 4.4.2 Example Automatic Emails

## Example 1: Send Email To An Administrator When A Project Request Created

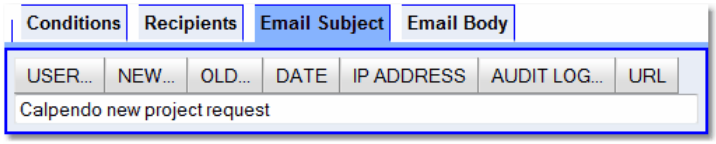
This first example shows how to send an email to an administrator when somebody creates a *Project*[251] whose *status*[252] is **Requested**. A *Project* is a **Calpendo** object, the details of which do not matter here, except to know that it has a *status* *property*[252].

1. First, go to the **Automatic Emails** page and press the **Create** button to create a new Automatic Email.
2. Give it a name, like **Project request to admin**
3. Specify the *Biskit Type*[250] as **Project**
4. Specify an action type of **Create**

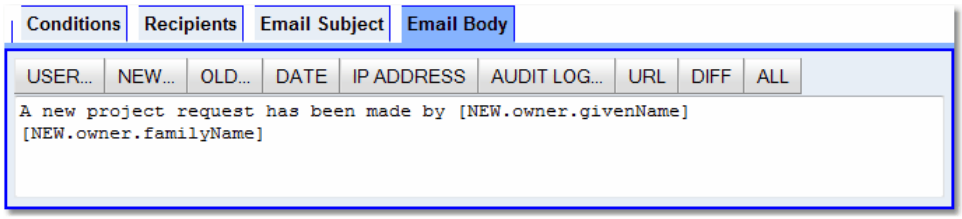



5. Add a *condition*[250]: **Status** is **Requested**

6. Add the recipients you require
7. Enter the email's subject




8. Specify the text of the email. This can reference *properties* of the project created and the user who created it.

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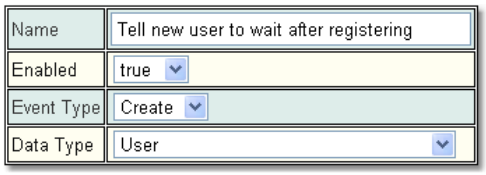
## Example 2: Send Email To A New User After They Register

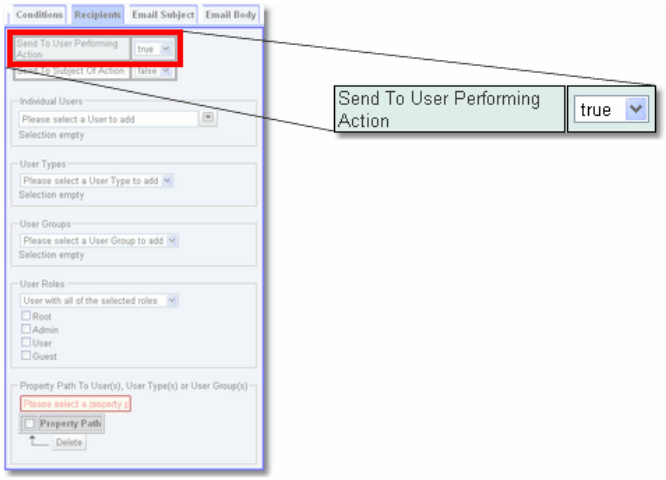
This example shows how to create an **Automatic Email** that will be sent to a new user immediately after they register with **Exprodo DB**. We need to make sure it gets sent when a new **User** is created, and that the email gets sent to the new user.

1. Create an Automatic Email that is triggered when a **User** is **Created**.



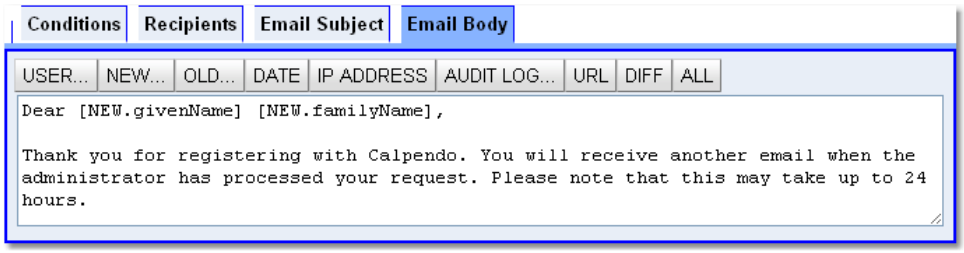

2. Add a *condition*: **Status** is **Requested**

3. On the **Recipients** tab, set **Send To User Performing Action** to **true**.




4. On the **Email Subject** tab, enter the text you want to be the subject of the email.

5. On the **Email Body** tab, enter the text you want to be the main content of the email.

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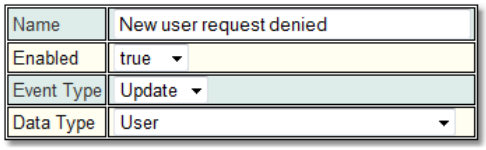
## Example 3: Send Email To A User When New User Request Denied

This example shows how to send an email to user who has just registered (so the **status** is set to **Requested**) but had their request denied (so the **status** has changed to **Denied**).

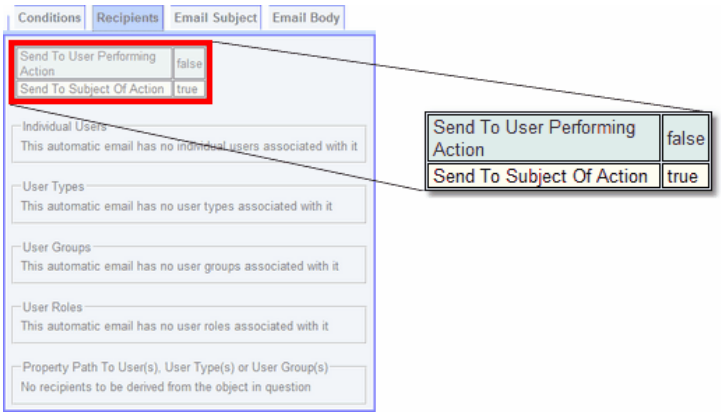
1. Create an Automatic Email that is triggered when a **User** is **Updated**.



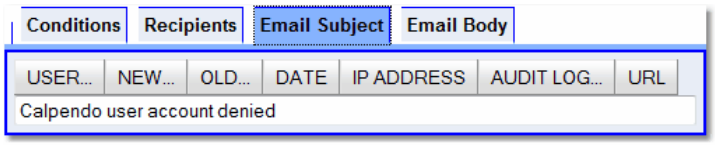

2. Add a *condition*: **Old Value** is **Requested**

3. Add a *condition*: **New Value** is **Denied**

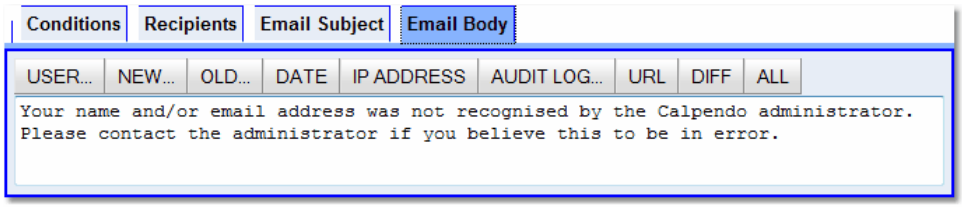
4. Set **Send To Subject Of Action** to ***true***;


Conditions
Recipients
Email Subject
Email Body
Send To User Performing Action
false
Send To Subject Of Action
true
Individual Users
This automatic email has no individual users associated with it
User Types
This automatic email has no user types associated with it
User Groups
This automatic email has no user groups associated with it
User Roles
This automatic email has no user roles associated with it
Property Path To User(s), User Type(s) or User Group(s)
No recipients to be derived from the object in question
Send To User Performing Action
false
Send To Subject Of Action
true

5. Enter the email's **Subject**




6. Enter the email's main content

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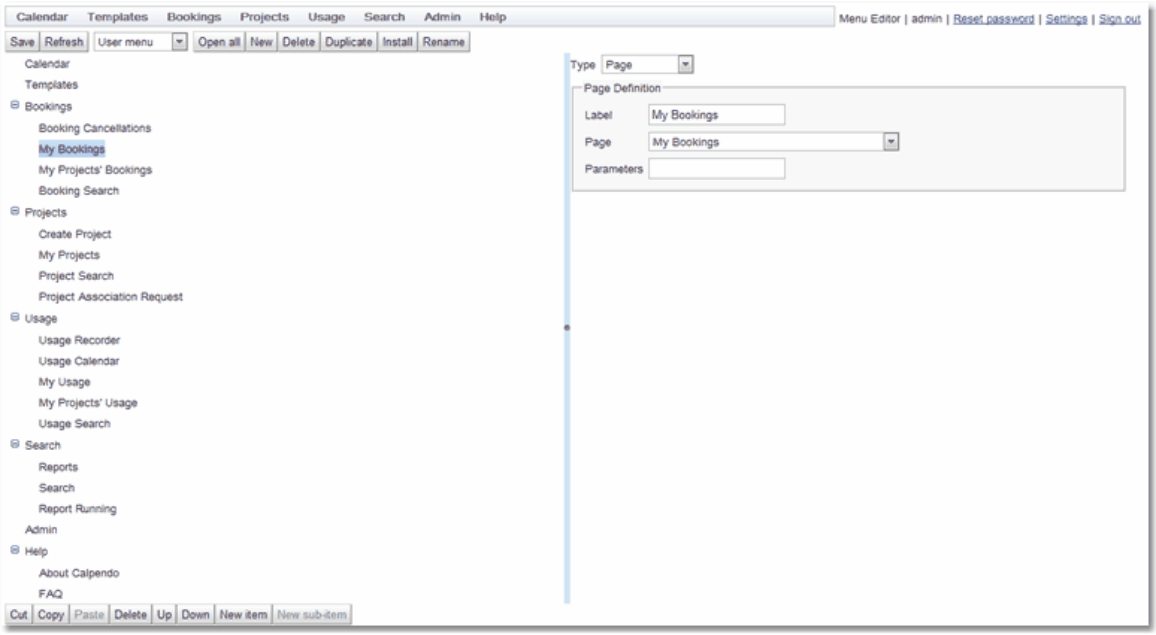
## 4.5 Menu Editor

Using the **Menu Editor** page the administrator can create, modify and delete the menus that exist in **Exprodo DB**. Once menus are created, a menu can be assigned to a user either by relying on the *global preferences* [251] for new users (see the Menus [150] tab of Global Preferences) [150] or by manually selecting the menu for particular users (see Changing A User's Settings [70]), allowing menus to be set up by the *users role* [253] or on a user by user basis. There are many different types of pages that can be added to a users menu. They include but are not limited to:

1. Customised search or *data explorer* [250] pages
2. Customised calendar [250] pages using *bookmarks* [250]
3. Pages that open up web pages external to **Exprodo DB**
4. Running predefined reports
5. Pages normally found only on the **Admin** menu
6. Customised *Biskit* [250] editor pages

The **Menu Editor** page consists of four parts:

1. The menu tool bar: this is the tool bar at the top of the page, and all the buttons operate on whole menus at a time.
2. The menu item tool bar: this is the tool bar at the bottom of the page, and all the buttons operate on single items within a menu.
3. The left pane: this shows the content of the currently selected menu.
4. The right pane: this shows the detail of the currently selected menu item

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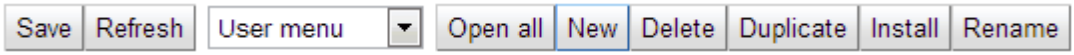
## The Menu Toolbar (at the top of the page)

The tool bar at the top of the page contains buttons that operate on whole menus at a time.

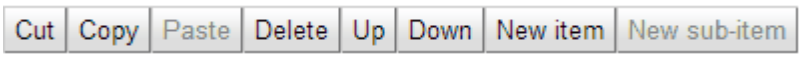



For a complete description of the standard toolbar buttons read the Toolbar Button Standard Definition[15] chapter.

| Tool Bar Item | Description |
|---|---|
| **Menu drop-down** | Shows a list of all the menus. Select one of them to load that menu so that it can be edited. |
| **Open all** | Opens all the menu items in the current selected menu |
| **New** | Creates a new menu |
| **Delete** | Deletes the currently selected menu. Note that this doesn't take effect until the **Save** button is pressed. |
| **Duplicate** | Creates a copy of the currently selected menu. This doesn't take effect until the **Save** button is pressed. |
| **Install** | Installs the currently selected menu into the browser. This is not a permanent change. When the browser is refreshed or when the current user logs out, the menu reverts to its previous state. This allows the administrator to see exactly what a menu would look like when in use. |
| **Rename** | Renames the currently selected menu. |

## The Menu Item Toolbar (at the bottom of the page)

The tool bar at the bottom of the page contains buttons that operate on single menu items.




For a complete description of the standard toolbar buttons read the Toolbar Button Standard Definition[15] chapter.

| Tool Bar Item | Description |
|---|---|
| **Up** | Moves the currently selected menu item up |
| **Down** | Moves the currently selected menu item down |
| **New item** | Creates a new menu item at the same level as the currently selected menu item. |
| **New sub-item** | Creates a new menu item as a child of the currently selected menu item. |

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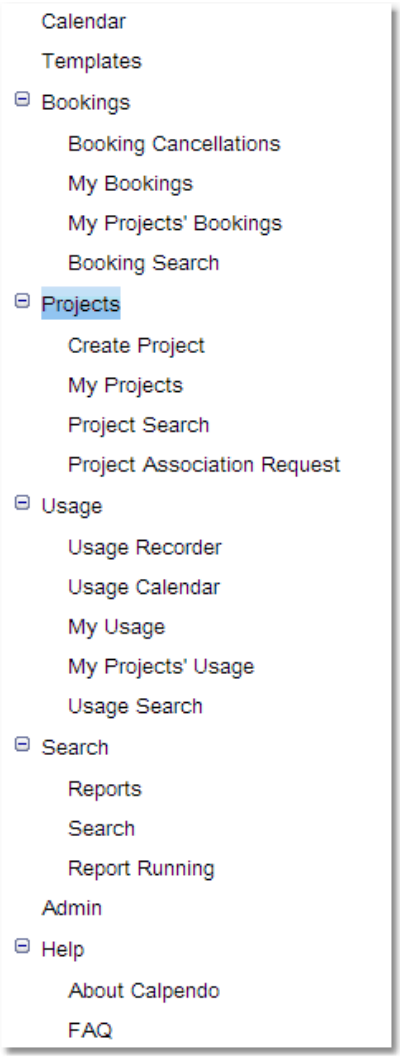
## The Left Pane




This shows a tree with the contents of the currently selected menu. If an item is selected, then:

- that menu item is loaded into the right pane so you can modify the item
- use the Menu Item Toolbar to operate on the selected menu item

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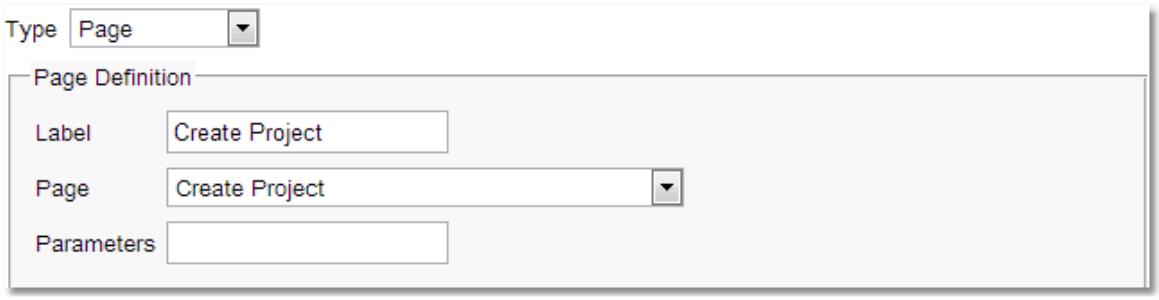
## The Right Pane

This shows the details of the currently selected menu item. The first *property*[252] shown is the menu item's type. There are five types, as described in this table:




| Type | Description | |
|---|---|---|
| Page | This type of menu item is one that shows a page. When menu item is set to **Page**, the following properties need to be set: | |
| | **Property** | **Description** |
| | Label | This is the text that should be displayed on the menu. |
| | Page | This is a drop-down that allowing selection from all the different types of pages that **Exprodo DB** supports. |
| | Parameters | Some pages support additional parameters. If a page is selected that supports additional parameters, then the parameters value will be filled with a template that shows the sort of content expected. |
| Menu | This type of menu item is one that contains only sub-menu items. When this type is selected, also select the label that should be displayed for the sub-menu. | |
| Separator | Creates a horizontal line in the menu that separates the items before and after it. Once selected, also fill in the label. The label is not shown on the menu itself, but is used to display the item in the menu editor's left pane. | |
| Window | This represents a menu item that, when selected, will open another browser window. Set the following properties: | |
| | **Property** | **Description** |
| | Label | This is the text that should be displayed on the menu. |
| | URL | This is the address of the web page that should be loaded into the newly created browser window. |

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<table>
<tr><th>Type</th><th colspan="2">Description</th></tr>
<tr><td rowspan="4">Custom Page</td><td colspan="2">This type of menu item is one that shows a custom built page. After choosing Custom Page, then set the following properties:</td></tr>
<tr><td>Property</td><td>Description</td></tr>
<tr><td>Label</td><td>This is the text that should be displayed on the menu.</td></tr>
<tr><td>Token</td><td>What the configurer wishes to appear in the browsers top address bar when this menu item is selected for example in the case of the Menu Editor: #menuEditor</td></tr>
<tr><td>Custom Page Type</td><td>The type of custom page to create, there are seven possible types.<br>1. Biskit 250 Tree Editor<br>2. Bookmark Page<br>3. Customised Search Page<br>4. Data Explorer Page<br>5. Frame Page<br>6. Run Predefined Report<br>7. Search Results Page</td></tr>
<tr><td>Additional Information</td><td>This depends on the custom page type chosen</td></tr>
</table>

More information on the different types of **Custom Pages**.

| Page | Description | Additional Information |
|---|---|---|
| *Biskit* Tree Editor | A page which which will display and edit a user-defined selection of *Biskit Types* 250. For example, if new *Biskit Types* have been created such as **Doctor** and **Nurse** and both a **Doctor** and a **Nurse** are associated with *bookings* 250, then create a menu item that takes the user to a page where they can create the **Doctors** and **Nurses**. | A list of the *Biskit Types* to be displayed on the page. Once created the order can be adjusted. |
| *Biskit* Tree Viewer Page | Provides a way to display a number of HTML pages with a navigation panel for users to choose which page to view. | 1) The *Biskit Type* to be displayed<br>2) The *property* with the information to be viewed. |
| *Bookmark* Page | A *Calendar* page with the specified *bookmark* set up | The *bookmark* to be used. |
| Customised | A search page customised to your | 1) The *Biskit Type* to be searched for |

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| Page | Description | Additional Information |
|---|---|---|
| Search Page | specific requirements | 2) The report type to be used<br>3) A descriptor to define additional search buttons available on the search page. See below for a definition of the descriptors allowed.<br>4) Any Conditions to be used in the search |
| Data Explorer Page | A customised *Data Explorer* page | 1) The *Biskit Type* to be displayed<br>2) The ID of the particular record to be displayed. 0 or empty means display all<br>3) Whether a user viewing the custom page may change the *Biskit Type* being displayed. |
| Frame Page | Opens any URL as a frame inside **Exprodo DB**. This will display with the menu at the top of the page and then the content of the URL specified below. | The URL to be displayed.<br>For example:<br>url=http://www.exprodo.com |
| Run Predefined Report | Runs a report either system or personal. | The report to be run |

The following page type may be useful when customising menus:

| Page | Description | Parameters Example |
|---|---|---|
| *Layout Editor* 251 | Opens up an editor which allows the user to define how to layout *properties* in a *Biskit* so that they can be read and managed easily. This is useful if your type has a large number of properties to be displayed. | |
| Find by URL | Opens up a page based on a URL | searchtype= |

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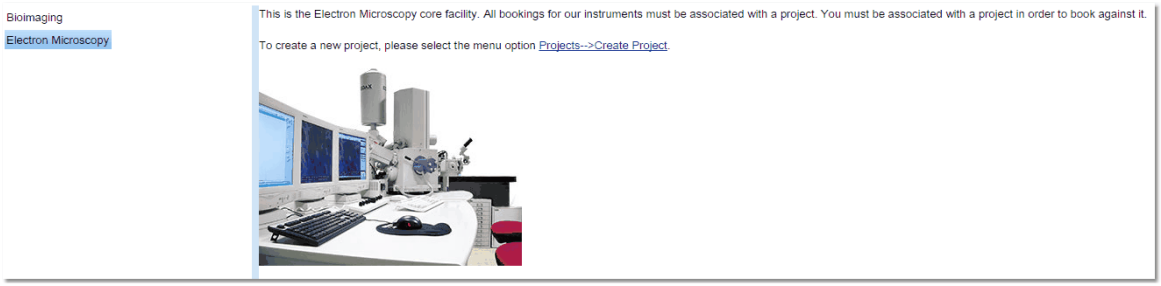
## Biskit Tree Viewer

Create a custom *biskit* and give it a **Name** *property* and a **Content** *property*. The **Content** *property* should be of type **String,** and of subtype **HTML**.

Create a number of instances of the new Biskit Type, giving each a name and adding content in rich text associated with the name. This can include links and images.

Use the **Menu Editor** to add a custom page of type **Biskit Tree Viewer**, and specify the type of *biskit* and which *property* contains the **HTML** content to display.

Users then see the names of the *biskits* appear in a navigation pane on the left with the associated content on the right.


Bioimaging
Electron Microscopy
This is the Electron Microscopy core facility. All bookings for our instruments must be associated with a project. You must be associated with a project in order to book against it.
To create a new project, please select the menu option Projects-->Create Project.

## Descriptors for Custom Search Pages

The definition of the format of a descriptor:

- line := {group}[;{group}]*
- {group} := [{initialFlags}[:[css-class][:label]]]{item}[,{item}]*
- {initialFlags} := (H|V|G|F|E|C)[S|L][A][T|O]
- {item} := {propPath}[:{itemFlags}][*][!]
- {itemFlags} := (S|L)
- {propPath} = a path, this may be the name of a property e.g. "status", or a path to the property e.g. "project.status"

Where:

- css-class is the CSS class to be applied to the top level
- the initial flags are:
  - flags to indicate the overall behaviour of the search:
    - H = horizontal button bar
    - V = vertical panel
    - F = Form-like container that displays each item with a heading in the line above the search item.
    - G = Growing form - displays like a form but can be hidden or shown by ticking a checkbox.

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        - E = Expanding, a container showing a checkbox for each item, where clicking the checkbox will open up the search item
        - C = Captions around each of the items in the container
        - F = Form, labels above each widget
    - flags to indicate the default size of items. Note that these can be overridden by size flags placed on each item:
        - S = Small - widgets in this container should be small size by default
        - L = Large - widgets in this container should be full size by default
    - Sorting flags:
        - No flag means items are presented in the order specified and (when using the A flag, their natural order)
        - T = sort all items in this container by their text label
        - O = sort all items in this container by their bakery-assigned order
    - Miscellaneous flags:
        - A = automatically add items for all known properties not added elsewhere
- item flags define the size:
    - S = small - minimal widgets in a row
    - L = large - widgets taking full size the whole time

Examples:

- status:*;service.provider:*;service.location:*;{EAT}
- {CL:myCSSclass:My Label}status:*,service.provider:*;{F}service.location:*

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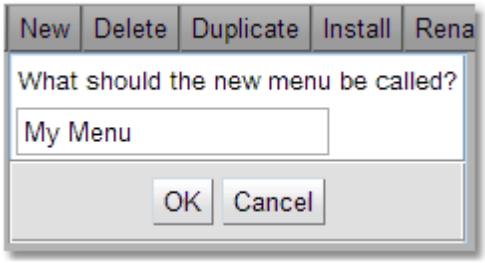
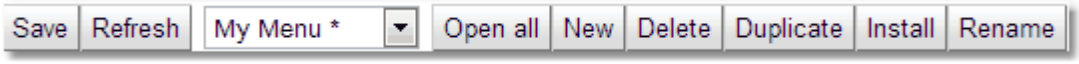
## Creating A New Menu

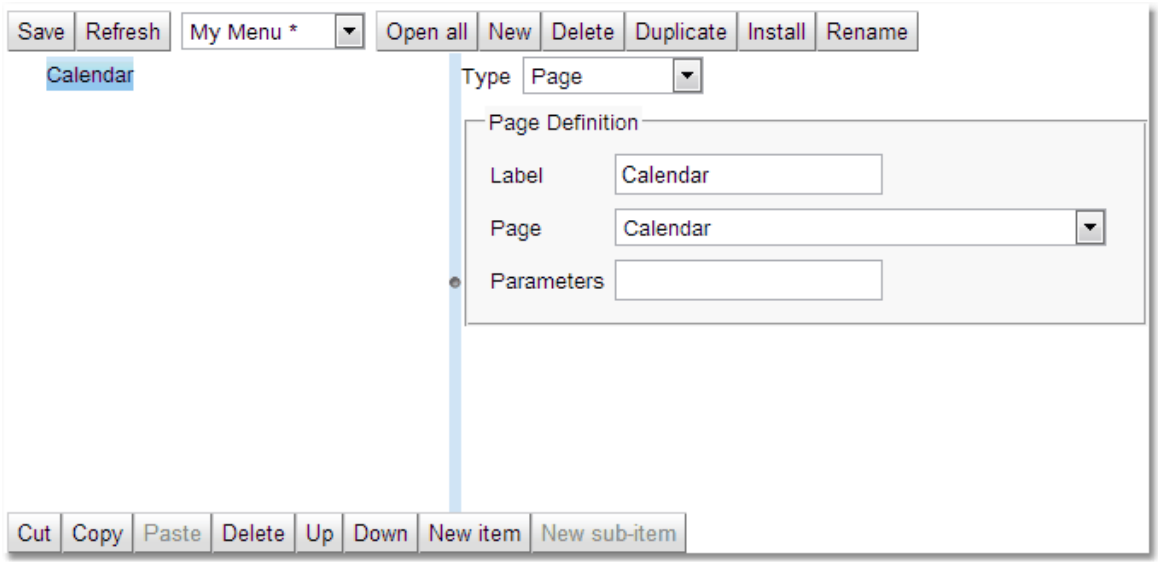
Press **New** on the menu toolbar, and type the name of the new menu into the pop up.




The name of the menu will now appear in the **Menu Toolbar Menu** drop down, it will have a * next to it to indicate it is being edited and has not been saved yet.




Using the **Menu Item Toolbar** at the bottom of the page, press **New Item**, then in the right pane set up the **Type** to be **Page**, and for the **Page Definition** set **Label** to **Calendar** and **Page** to **Calendar**. This will create the first menu item.

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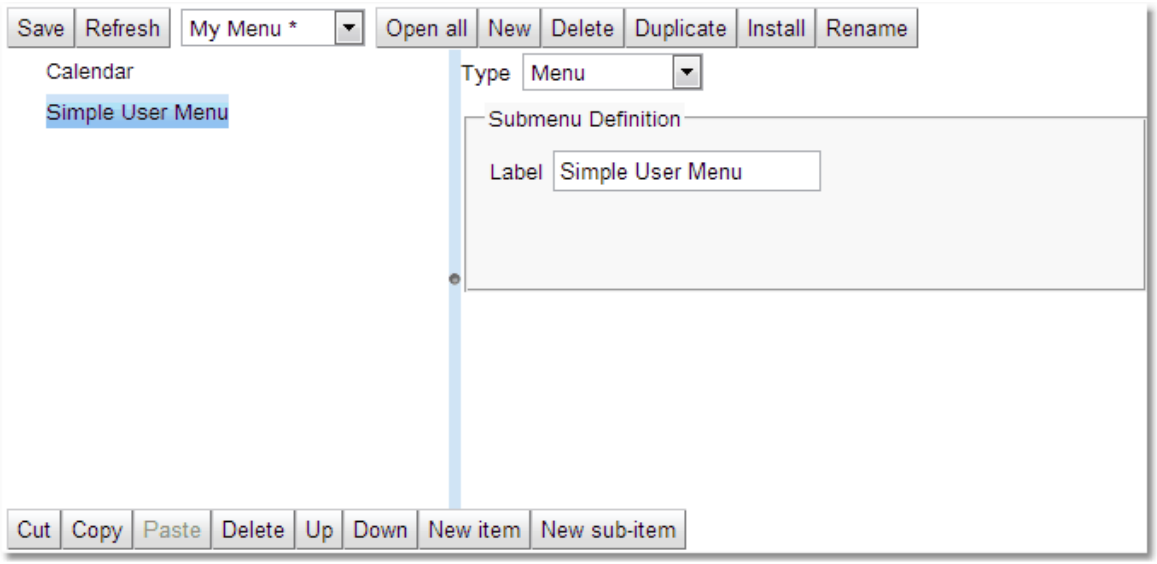
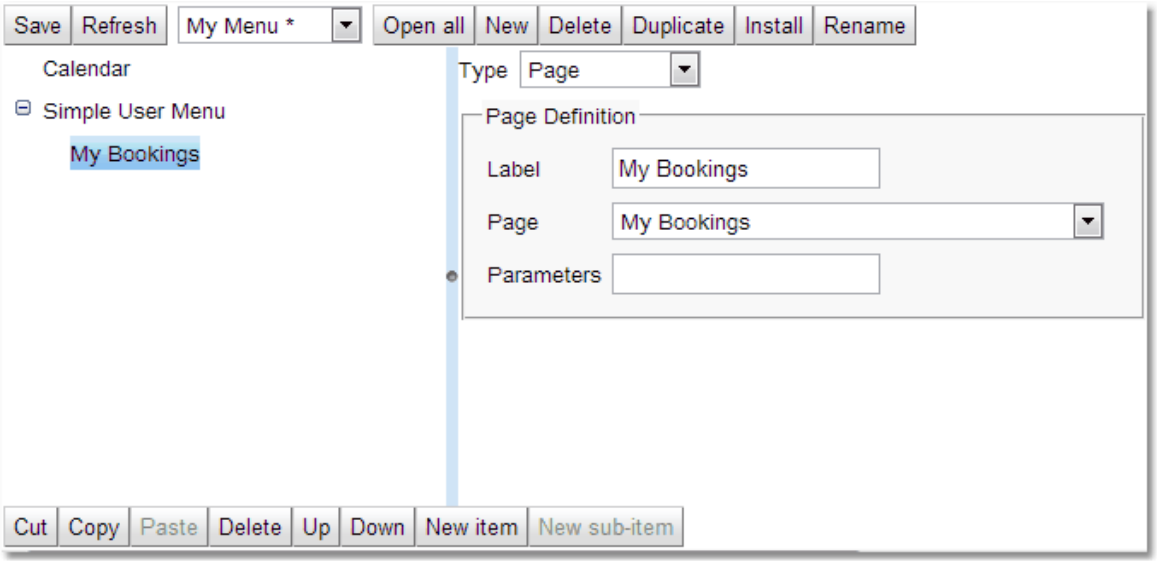
Using the **Menu Item Toolbar** at the bottom of the page, press on **New Item**, then in the right pane set up the **Type** to be **Menu**, and for the **Submenu Definition** set ***Label*** to **Simple User Menu**. This creates a simple sub menu.




Using the **Menu Item Toolbar** at the bottom of the page, press **New Sub Item**, then in the right pane set up the **Type** to be **Page**, and for the **Page Definition** set **Label** to **My Bookings** and **Page** to **My Bookings**. This will put an item on the **Simple User Menu** sub menu.

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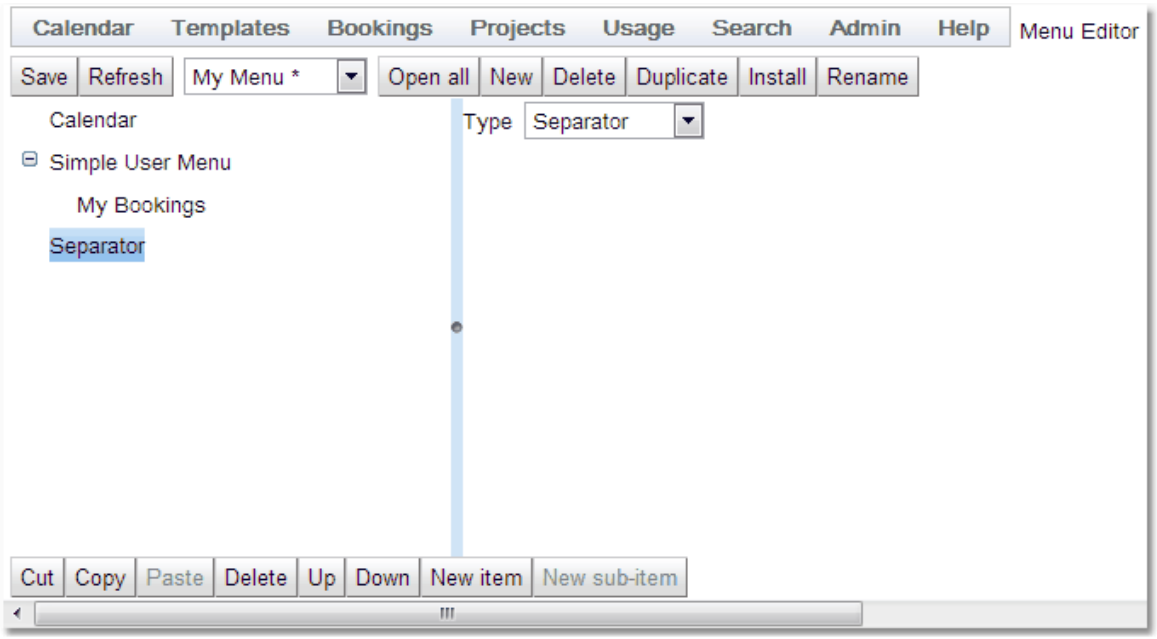
Click on **Simple User Menu** then using the **Menu Item Toolbar** at the bottom of the page, press **New Item**, then in the right pane set up the **Type** to be **Separator**. This creates a simple separator to which is a line across the menu to split the menu into sections.




Continue adding in pages, custom pages, sub menus and separators until the menu is created. Once finished use the **Install** button on the **Menu Toolbar** to install the menu temporarily into the browser. Then check the menu to make sure it is what is required. Remember to use the **Up Down** buttons to change the order of items in the menu. When finished use the **Save** button on the **Menu Toolbar** to save the menu. The menu will still be in the menu drop down box, but will no longer have a star next to it as it has been saved. Look at the chapter on Changing a Users Settings 70 to see how to apply this menu to a particular user. Remember putting this menu as an option in Global Preferences will only change that menu for new users not existing users.

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## 4.6 User Authentication Methods

THis section outlines how an Administrator can set up a number of different methods for user authentication, allowing **Exprodo DB** to be used in a single sign on environment.

### 4.6.1 Authentication Methods

There are three main types of authentication:

1) **Local**: The current **Exprodo DB** does the authentication. User names and encrypted passwords are stored in the **Exprodo DB** database.

2) **Internal**: These are built-in methods that allow **Exprodo DB** to send your user name and password to another system for authentication. **Exprodo DB** does not store your password in this case, but does handle it during login. The currently supported internal authentication methods include using an email server (**SMTP** or **IMAP**), any HTTP basic authentication system, or another **Exprodo DB**.

3) **External**: The web server that users connect to is configured to provide authentication, for example using a single-sign-on system or perhaps LDAP. In this case, **Exprodo DB** never sees users passwords, and authentication is solely the responsibility of the web server.

All systems automatically have **Local** authentication initialised but the administrator may also set up a number of non-local authentications and may switch off **Local** authentication. The administrator cannot switch off the authentication system they are currently logged in with, to ensure that they cannot be accidentally locked out.

#### Common Options For All Authentication Methods

| Name | Data Type | Description |
|---|---|---|
| Type | String | The type of authentication method. |
| Name | String | The name assigned to this method. Must be unique. |
| Login Allowed | Boolean | Whether users can login using this method. |
| New User Registration Allowed | Boolean | Whether new users can register using this method. If True then new users may register for this authentication method even if logins are not allowed. |

#### Local Authentication

**Local** authentication has no additional options.

#### IMAP Authentication and SMTP Authentication

| Name | Data Type | Description |
|---|---|---|
| Host | String | The mail server's IP address or name. |
| Security | JavaEnum | Choose the type of security to be used:<br>**None, STARTTLS, SSL/TLS** |

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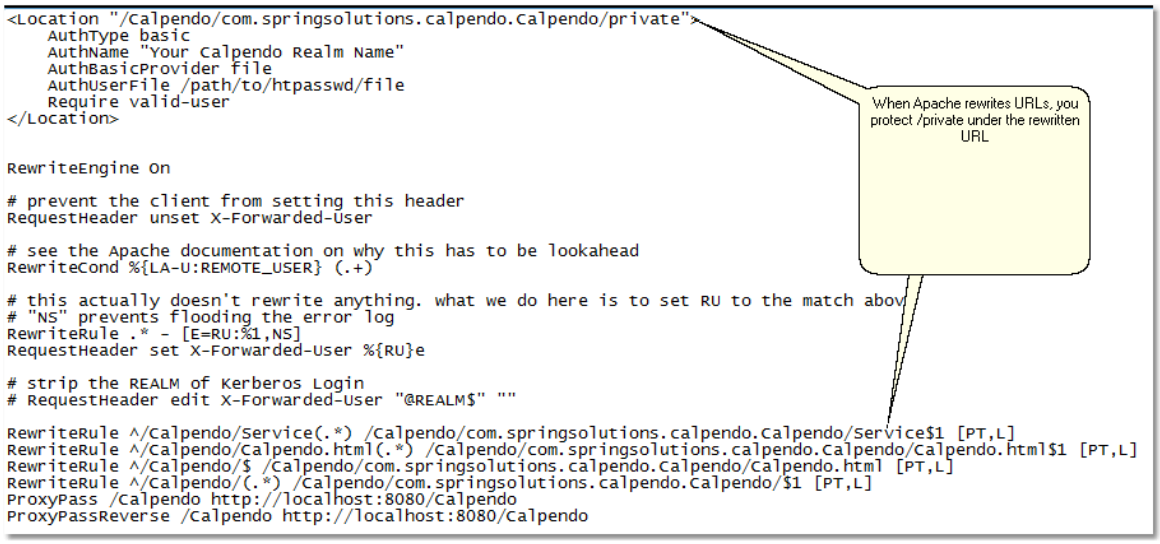
## Basic Authentication

| Name | Data Type | Description |
|---|---|---|
| URL | String | The address of the website doing the authentication. |
| Realm | String | The name of the system, that is doing the authentication. |

## External Authentication

| Name | Data Type | Description |
|---|---|---|
| Login Name Header | String | The name of the HTTP header that will contain the user's login name (this defaults to X-Forwarded-User) |
| Display Type | JavaEnum | How to display the frame that will contain the authentication handshake. If not hidden then choose its size.<br>Choice of**: Hidden, Inline, Popup** |
| Display Width | String | The width of the frame within the pop up or on the login page. |
| Display Height | String | The height of the frame within the pop up or on the login page. |

While you can use HTTP basic authentication using an internal authentication method, it's also possible to set up HTTP basic authentication using external authentication. The following shows an example of an excerpt from an Apache virtual host configuration that sets up HTTP basic authentication and also passes the REMOTE_USER setting that it generates to **Exprodo DB** by setting the X-Forwarded-User HTTP header. You can use any header for this, but you need to tell **Exprodo DB** which header to examine by setting the **Login Name Header** property. When Apache rewrites URLs, you protect /private under the rewritten URL




```
<Location "/Calpendo/com.springsolutions.calpendo.Calpendo/private">
    AuthType basic
    AuthName "Your Calpendo Realm Name"
    AuthBasicProvider file
    AuthUserFile /path/to/htpasswd/file
    Require valid-user
</Location>

RewriteEngine On

# prevent the client from setting this header
RequestHeader unset X-Forwarded-User

# see the Apache documentation on why this has to be lookahead
RewriteCond %{LA-U:REMOTE_USER} (.+)

# this actually doesn't rewrite anything. what we do here is to set RU to the match abov
# "NS" prevents flooding the error log
RewriteRule .* - [E=RU:%1,NS]
RequestHeader set X-Forwarded-User %{RU}e

# strip the REALM of Kerberos Login
# RequestHeader edit X-Forwarded-User "@REALM$" ""

RewriteRule ^/Calpendo/Service(.*) /Calpendo/com.springsolutions.calpendo.Calpendo/Service$1 [PT,L]
RewriteRule ^/Calpendo/Calpendo.html(.*) /Calpendo/com.springsolutions.calpendo.Calpendo/Calpendo.html$1 [PT,L]
RewriteRule ^/Calpendo/$ /Calpendo/com.springsolutions.calpendo.Calpendo/Calpendo.html [PT,L]
RewriteRule ^/Calpendo/(.*) /Calpendo/com.springsolutions.calpendo.Calpendo/$1 [PT,L]
ProxyPass /Calpendo http://localhost:8080/Calpendo
ProxyPassReverse /Calpendo http://localhost:8080/Calpendo
```

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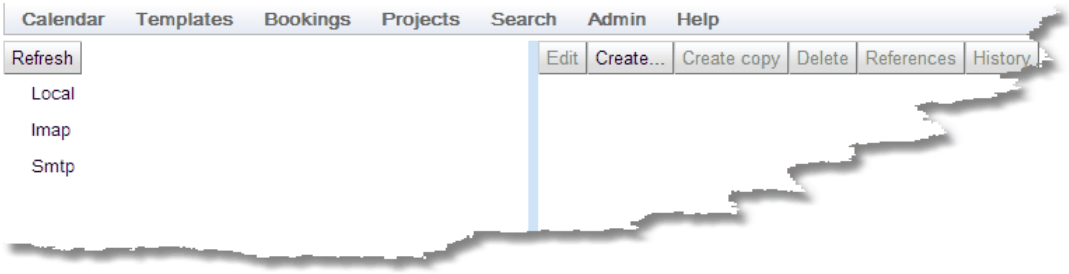
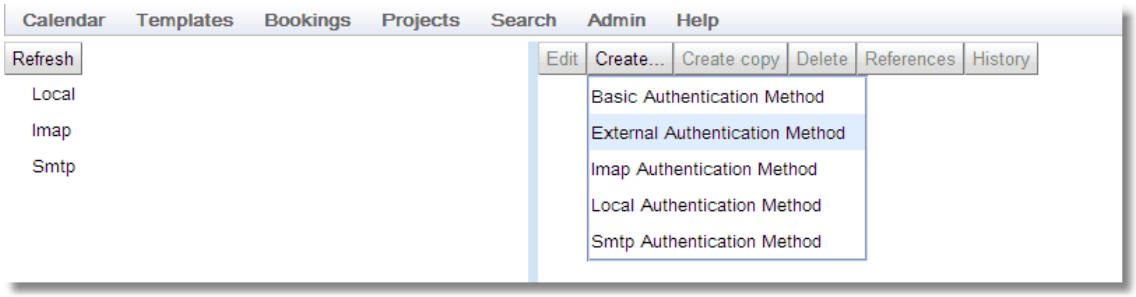
### 4.6.2 Authentication Methods Editor

Setting up different Authentication Methods (alternatively known as Single Sign On) is done using the **Authentication Methods Editor**, which by default is available on the menu as **Admin->Authentication Methods**.

The **Authentication Methods Editor** shows all the currently defined authentication methods and allows the administrator to create, update and delete them. This is what the  looks like when first opened.

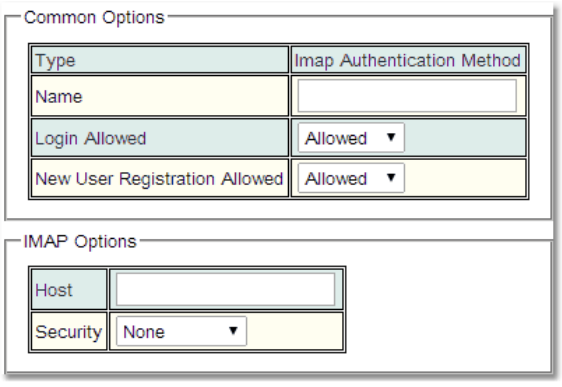



For a complete description of the standard toolbar buttons read the Toolbar Button Standard Definition[15] chapter. The only difference from the standard is that when the **Create** button is clicked a drop down menu appears to allow the administrator to choose which type of Authentication Method to be created.




After pressing **Create** or the **Edit** button to make the page editable the button bar changes:

The detail view for the authentication method will also appear, fill in the details and **Save** the method.

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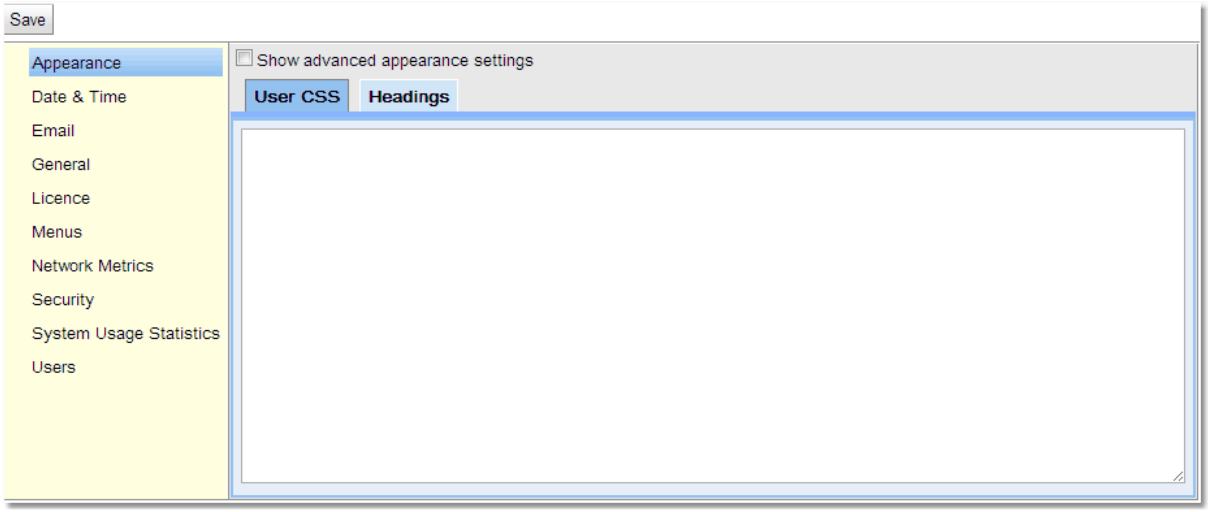
## 4.7 Global Preferences

The **Global Preferences** page appears by default on the menu as **Admin-->Global Preferences** and provides settings that change the way **Exprodo DB** operates.

Once all the required changes are made on each tab the use the **Save** button to implement them.




.

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### 4.7.1 Appearance

**Appearance** controls the look and feel of **Exprodo DB**. It does this by allowing the creation of CSS to overwrite the default values. The user can also set the headings for the **Host Page** and for the **Login page**, as well as a banner to be displayed at the top of each page. The **Headings (debug)** setting will only be shown when the **Show advanced appearance** box is ticked.

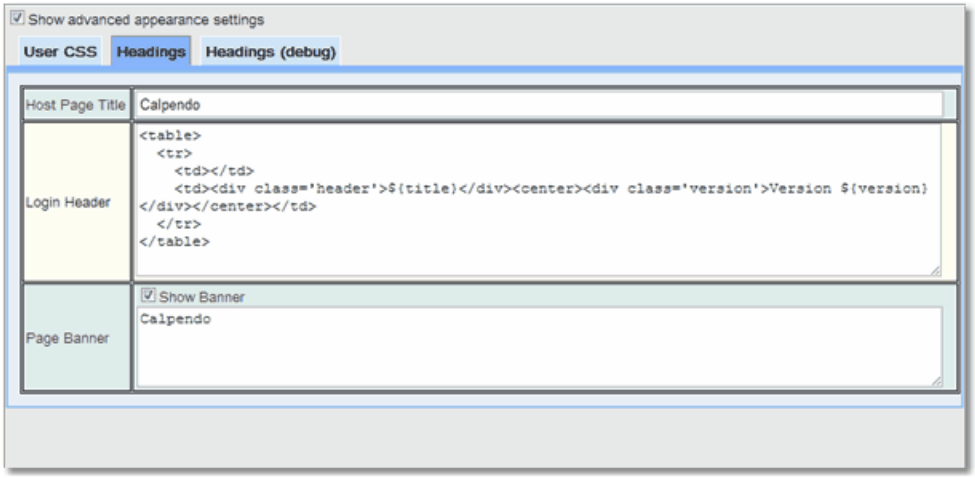
| Setting | Description |
|---|---|
| User CSS | To specify Cascading Style Sheets (CSS) that you would like to be used by **Exprodo DB**. Anything specified here will override the default values, so that you can customise the look and feel. |
| Headings | This sets several properties that control the look of **Exprodo DB**, see the table below for the headers that can be changed. |
| Headings (debug) | To specify the same sort of content as used for Headings above, but allows alternative values when **Exprodo DB** is in debug mode. |

An example of User CSS, would be the following

```
#registerButton
{
display: none;
}
```

This would remove the *Register New User* button from the login page.

| Heading options | Description |
|---|---|
| Host Page Title | This changes the HTML title of the page used for **Exprodo DB** so that it will show in the web browser. |
| Login Header | This lets the user provide alternative HTML for the header that appears on the login page. |
| Page Banner | If a page banner is required, this is the HTML that will be shown at the top of every page. |

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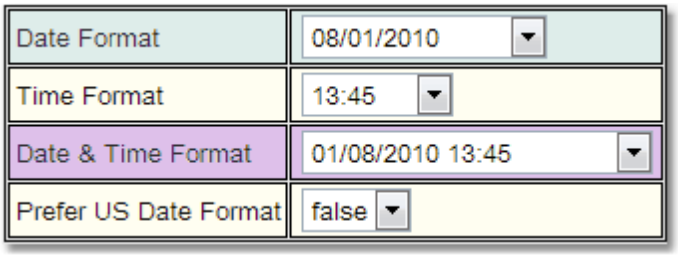
### 4.7.2 Date And Time

The **Date And Time** tab of the **Global Preferences** page specifies formats to use for dates and times within **Exprodo DB**. These are used in a number of places:

1. In Automatic Emails sent out by the server that contain and dates or times
2. When a new user is registered, the date and time formats of their user settings is copied from the *global preference*[251]

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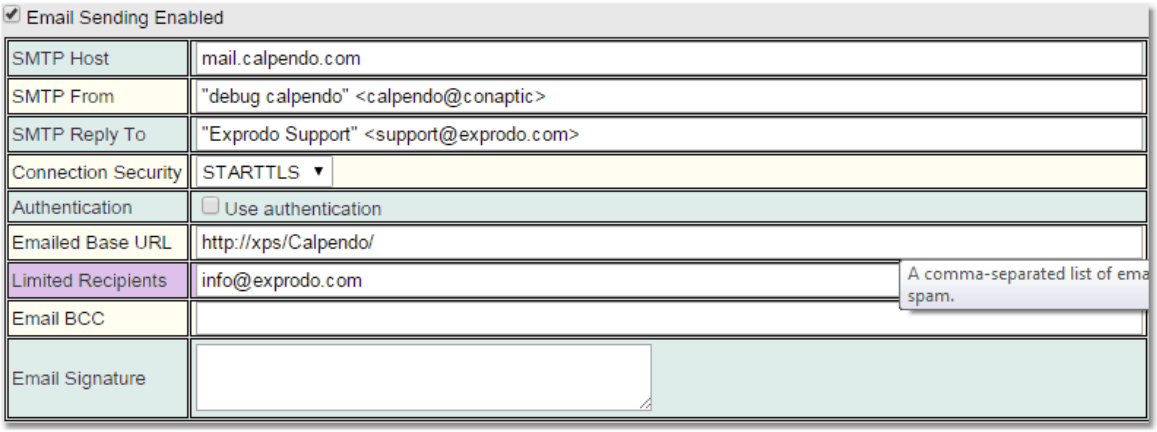
### 4.7.3 Email

The **Email** tab of the **Global Preferences** page specifies the following:




| Setting | Description |
|---|---|
| Email Sending Enabled | Set this to true to allow **Exprodo DB** to send emails, and false to disable all outgoing emails. |
| SMTP Host | This is the hostname of the SMTP server to be used for sending outgoing email. |
| SMTP From | This is the name, and possibly email address, that outgoing emails should appear to come from. For example, for a **Exprodo DB** running at example.com, choose a value like:<br>"Example Exprodo DB" <Exprodo DB@example.com> |
| SMTP Reply To | The reply to address on any email that is sent out. Set so that if users do reply to an email it goes to someone rather than getting an error message. |
| Connection Security | Choose the security level that should be used for the connection between your SMTP email server and the **Exprodo DB** server. |
| Authentication | Select whether to use authentication for the connection between your SMTP email server and the **Exprodo DB** server, and if so, select the user name and password that should be used by **Exprodo DB** to connect. |
| Emailed Base URL | This is the URL that should be used to get to **Exprodo DB** and is used by Automatic Emails 116 that reference a URL 124. It is useful when sending an email that includes a direct link to a page within **Exprodo DB**, and the main part of the URL needs to be injected automatically. |
| Limited Recipients | During testing anything related to email, restrict the email addresses that are allowed to receive email from **Exprodo DB**. Provide a comma-separated list of email addresses to restrict outgoing email to go only to those addresses. If this field is left empty, then email will be allowed to go to anybody. |
| Email BCC | This is a comma-separated list of email addresses that should receive a copy of all outgoing emails from **Exprodo DB**. This is useful for checking that **Exprodo DB** is sending the expected emails, particular while **Exprodo DB** is being configured. |

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| Setting | Description |
| --- | --- |
| Email Signature | This is a signature that is included at the end of every outgoing email. If left empty, then a default signature will be added. |

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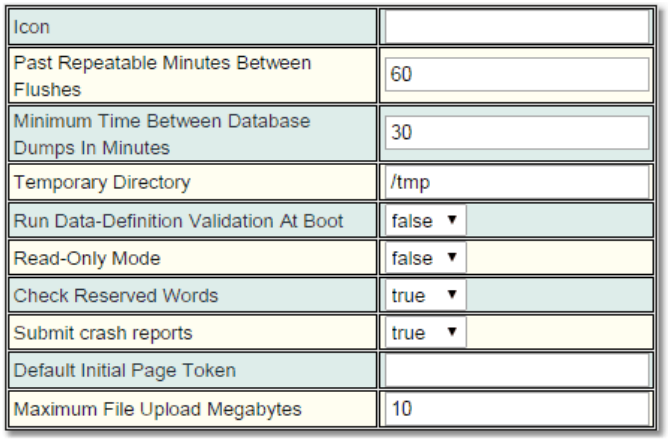
### 4.7.4 General

The **General** tab of the **Global Preferences** page provides the following:




| Setting | Description |
|---|---|
| Icon | This provides the name of an image file that should be used to display on the *Bookings Calendar*[250] and (using the default settings for the appearance headings[144]) on the login page. |
| Past Repeatable Minutes Between Flushes | **Exprodo DB** has some *Biskit Types*[250] that support repeats such as *Events*[250], *Bookings*[250] and *Time Templates*[252]. As the time for each instance of the *repeat*[252] passes, a new *Booking* or *Event* etc. is created to represent the instance of the repeat that happened. This is done so that, when a repeat *Booking* (or *Event* etc) is changed, you do not change the record of what happened in the past.<br>This setting sets up how often **Exprodo DB** looks for *repeats* that have just happened and need a new historical entry creating. |
| Minimum Time Between Database Dumps In Minutes | This limits the frequency with which database dumps can be created. This is here because database dumps take some time and can degrade system performance, so they don't want to be allowed to be run too often. |
| Temporary Directory | This is the name of a directory that is used to store temporary files that are created for downloading. |
| Run Data-Definition Validation At Boot | If *Biskit definitions*[250] are changed using the Bakery[173], then it is possible that the system may be left in an inconsistent state.<br>This setting disables the boot-time checks that are done to make sure the *Biskit definitions* are consistent. If there is a problem and boot-time checks are enabled, then **Exprodo DB** will not boot properly. If there is a problem and boot-time checks are disabled, then the user may be able to correct the problem in the Bakery[173], but the issue may cause something to work incorrectly in the meantime. |
| Read-Only Mode | This indicates whether **Exprodo DB** should operate in a read-only mode. |
| Check Reserved Words | Choose whether to enable protection that stops users from using reserved database words for table, column and property names when using the Bakery[173]. This is particularly important if exporting the **Exprodo DB** database to a different type of database. |

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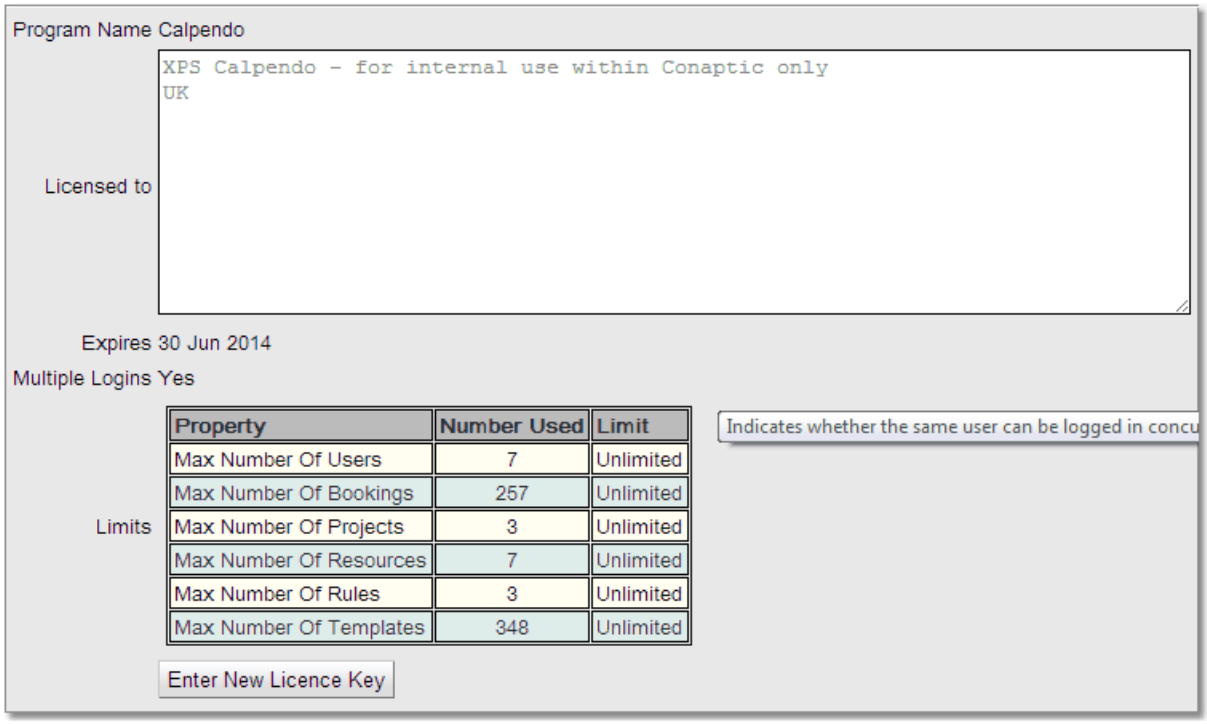
| Setting | Description |
|---|---|
| Submit Crash Reports | Choose whether to allow crash reports to be emailed to **Exprodo Software**. Automatic delivery of crash reports are a very useful tool for helping to find and fix problems and are only used for this purpose. |
| Default Initial Page Token | Choose which page is displayed by default when this program is first started. Enter the text after the '#' in the browser's address bar, and before any non-alphanumeric characters |
| Maximum File Upload Megabytes | choose the maximum size of a file to be uploaded as an attachment. The default is 10 Megabytes. |

### 4.7.5 Licence

This tab lets the administrator enter a licence key as well as see what the current licence key limits are. When provided with a new key, click the **Enter New Licence Key** button and copy and paste the new licence into the **Enter New Licence Key** text box, and press **OK**. Once you have been returned back to this view make sure you save the changes using the **Global Preferences Save** button.


Program Name Calpendo
XPS Calpendo - for internal use within Conaptic only
UK
Licensed to
Expires 30 Jun 2014
Multiple Logins Yes
Property
Number Used
Limit
Max Number Of Users 7 Unlimited
Max Number Of Bookings 257 Unlimited
Max Number Of Projects 3 Unlimited
Max Number Of Resources 7 Unlimited
Max Number Of Rules 3 Unlimited
Max Number Of Templates 348 Unlimited
Limits
Indicates whether the same user can be logged in concu
Enter New Licence Key

The table at the bottom of the **Licence** area will specify how many of each of the *properties* 252 are being used and the limit defined by the current key.

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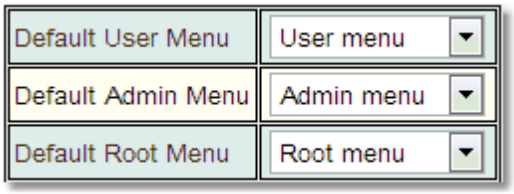
### 4.7.6 Menus

When a new user logs in to **Exprodo DB** for the first time, they are assigned a menu. This can overridden by specifying a menu, as described in Changing A User's Settings [70]. However, if *settings* [252] for a new user have not been set up, then the menu they are assigned depends on their *user roles* [253], and this is controlled by the **Menus** tab of the **Global Preferences** page:




| Setting | Description |
|---|---|
| Default User Menu | This is the menu to be assigned to users that have neither the **Admin** nor the **Root** *role*. |
| Default Admin Menu | This is the menu to be assigned to users that have the **Admin** *role* but not the **Root** *role*. |
| Default Root Menu | This is the menu to be assigned to users that have the **Root** *role*. |

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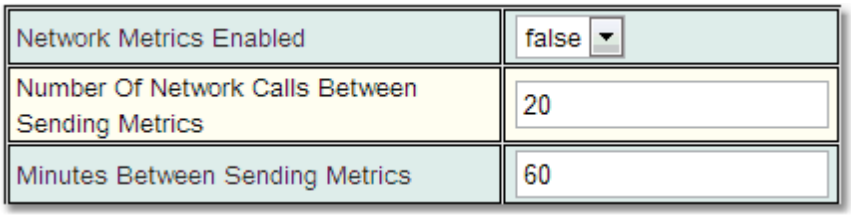
### 4.7.7 Network Metrics

**Exprodo DB** can keep information that tracks how long each network call took. This information can be turned on if you want to investigate network performance, but it should normally be left turned off.

The **Network Metrics** tab of the **Global Preferences** page provides the following:




| Setting | Description |
|---|---|
| Network Metrics Enabled | If this is set to *true*, then *network metrics* [251] will be kept, otherwise they will not. Note that by setting this to false, statistics that are already in the database will not be affected. Only new information will be affected by this setting. **Enabling Network Metrics** will slow down Exprodo DB a little. |
| Number Of Network Calls Between Sending Metrics | Indicates how many network calls each web browser much make before sending its *network metric* information to the server. The larger this number is, the fewer network calls will be created as an overhead. However, larger numbers increase the greater the memory requirements and also increase the amount of data that will be lost when the user closes their browser. This is because outstanding information collected by the browser but not sent to the server is not sent when the browser it closed. |
| Minutes Between Sending Metrics | This is the period of time between sending *metrics* to the server. This is only used during periods of low activity when you have some information to send to the server, but you are not active enough to reach the **Number Of Network Calls Between Sending Metrics**. |

If *Network Metrics* are enabled, the data will be stored in the database. In order to access the data use Search [27]. Once in the **Search** page set the **Search** *Biskit Type* [250] to **Network Metric**, as there could be a lot of information to be returned make sure Conditions... [17] are used to set at least time limits for the information returned. For more information read the chapter on using Search [27].

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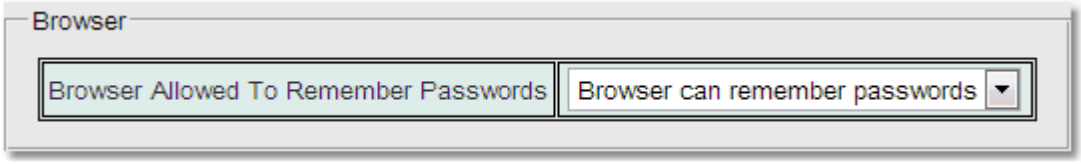
### 4.7.8 Security

The **Security** tab of the **Global Preferences** page sets up the items below:

#### Browser

A user can specify that their browser will remember logins and passwords. On public systems this may not be a good idea, so you can disable this facility.




| Setting | Description |
|---|---|
| Browser Allowed To Remember Passwords | **Exprodo DB** is configured so that it allows the user's browser to remember their login name and password (if this facility is enabled by each user's browser). Disable this facility at a global level by setting this to **false**. |

#### Password Content

This provides control of the content of passwords that people are allowed to use.

| Setting | Description |
|---|---|
| Minimum Password Length | This specifies how many characters must be in each password. A user will not be able to set a password that is shorter than this setting. |
| Require lower case characters | Specifies whether passwords must include lower case characters. |
| Require upper case characters | Specifies whether passwords must include upper case characters. |
| Require numbers | Specifies whether passwords must include numbers. |
| Require non-alphanumerics | Specifies whether passwords must include characters that are not numbers or letters. |

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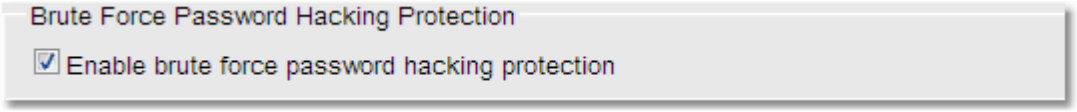
## Brute Force Password Hacking Protection

This enables or disables protection against brute force password hacking attempts. This should probably always be enabled. The only potential problem with this is that the protection involves disabling logging in from the IP address being used by the hacker. So if there is a hacker on your own network, it's possible that this protection could stop some legitimate users logging in temporarily. This is only ever temporary.

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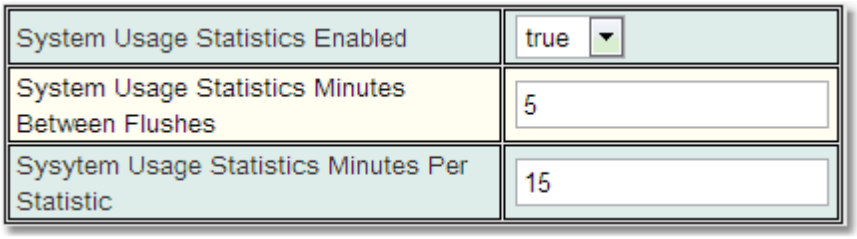
### 4.7.9 System Usage Statistics

**Exprodo DB** can keep *statistics* [252] that track how much each user has been using it. *Statistics* are kept by collating user activity into periods of time, so that **Exprodo DB** can record how much activity there was in each block of time. For each user that has been active in a given block of time, a *statistic* is stored in the database.

The **System Usage Statistics** tab of the **Global Preferences** page lets you provide the following:




| Setting | Description |
|---|---|
| Usage Statistics Enabled | If this is set to **true**, then *usage statistics* will be kept, otherwise they will not. Note that by setting this to **false**, *statistics* that are already in the database will not be affected. Only new *statistics* will be affected by this setting. **Enabling Usage Statistics** will slow down **Exprodo DB** a little. |
| Usage Statistics Minutes Between Flushes | This specifies how often **Exprodo DB** should flush *statistics* out to the database. For performance reasons, this should not be made too small. |
| Usage Statistics Minutes Per Statistic | This indicates how long each block of time is, during which *statistics* are put together. The larger this value is, then the less space will be taken in the database, and the lower the time resolution of the *statistics*. |

If **System Usage Statistics** is enabled, the data will be stored in the database. In order to access the data use Search [27]. Once in the **Search** page set the search *Biskit Type* [250] to **System Usage**. As there could be a lot of information to be returned make sure you use Conditions... [17] to set at least time limits for the information returned. For more information read the chapter on using Search [27].

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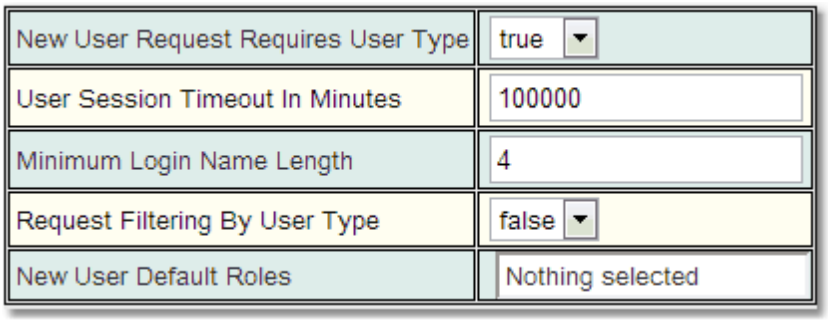
### 4.7.10 Users

The **Users** tab of the **Global Preferences** page sets up the following:




| Setting | Description |
|---|---|
| New User Request Requires User Type | If this is set to true, then whenever a new user registers with **Exprodo DB**, they must specify their *user type*[253]. See Configuring Types And Groups[94] for more information about types. |
| User Session Timeout In Minutes | This indicates how long a user's session will remain valid without any activity. Once this time has passed without them using **Exprodo DB**, then they will have to log in again. This should not be zero or negative. If a user is timed out, any request they make at the point of the time out will be automatically resubmitted when they log back in. |
| Minimum Login Name Length | This specifies how many characters must be in each user name. A user will not be able to register with a login name that is shorter than this setting. |
| Request Filtering By User Type | If this is set to true, then the user requests page will only show user requests from users with the same *user type* as the currently logged in user. Otherwise, all user requests will be shown. |
| New User Default Roles | When a new user is created specify the *roles*[253] they can have by default. See User Roles[54] for more information. |

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## 4.8 Layout Editor

The **Layout Editor** allows the user to define how the *properties*[252] of a *Biskit*[250] will be displayed. This is required because *Biskits* could have a large number of *properties*, numbering in the hundreds, and in order for users to find those *properties* to update them, it is necessary to organise them.

The **Layout Editor** allows the user to organise the *properties* of a *Biskit* into multiple **Property Groups**, **Property Groups** may themselves contain child **Property Groups**.

**Property Groups** at the same level may be organised in one of four ways, **Vertical Tabs**, **Vertical Tabs (Sorted by Name)**, **Horizontal Tabs** and **Captions**. **Property Groups** may have a heading and may also be hidden.

The *properties* contained within a **Property Group** may also be organised in one of four ways, **Simple Table**, **Multi Column Table**, **Radio Button Table** and **Custom HTML**.

For each table, row, column or cell the standard *CSS* can be changed allowing the user to set such things as font, background colour, border size, type and colour and many other attributes.

Finally for any **Property Group, Notes** can be set up to be created and then displayed in a **Notes Waterfall**.

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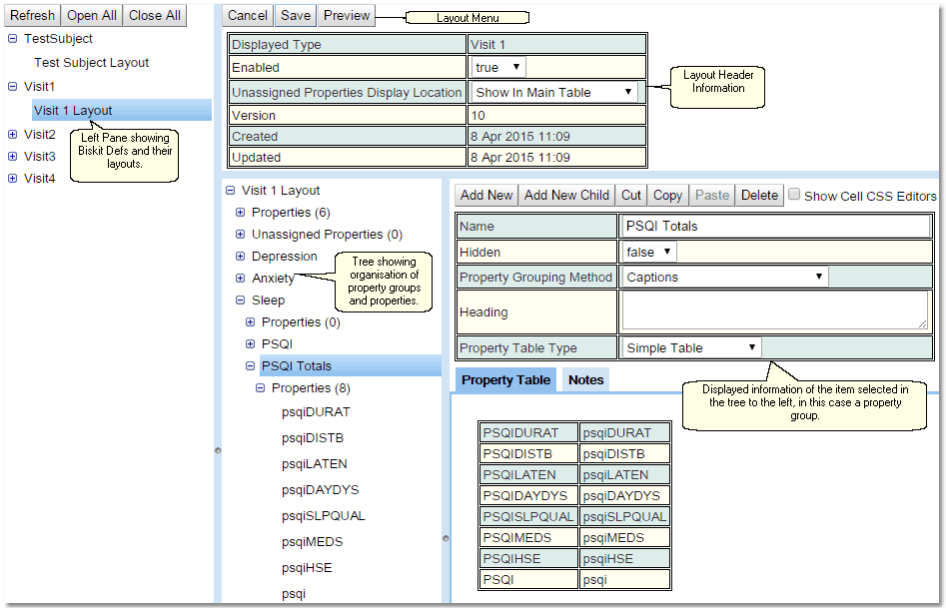
The **Layout Editor** is split into four sections in two panes.

1. The left hand pane shows a list of *BiskitDefs* 250 that have had layouts created for them, when a *BiskitDef* is expanded all the layouts defined for that *Biskit* will be shown. Any in red are currently not enabled.
2. The right pane is split into three areas:
   a. Top is the layout menu and the header information for the current layout. (**Top Pane**)
   b. Bottom left shows the organisation of the **Property Groups** and *properties* for this layout in the form of a tree. (**Organisation Pane**)
   c. Bottom right displays information depending on what is selected in the organisation tree in the bottom left pane. (**Information Pane**)
      i. If a **Property Group** is selected then the header information for that **Property Group** is viewed along with any *properties* assigned to that **Property Group**.
      ii. If a **Properties** branch is selected then the *properties* are shown in a list
      iii. If a single *property* is selected then information about that *property* will be shown.

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## Left Pane

The Left Pane shows the **Layout Tree** (see image above). Showing for each *BiskitDef* the layouts that are available. It also has a tool bar which allows the user to open and close all the branches to the tree.

For a complete description of the standard toolbar buttons read the Toolbar Button Standard Definition[15] chapter.

## Top Pane With Layout Toolbar

The **Top Pane** shows the header information for a layout. To create a new layout press the **Create** button and then choose the *BiskitDef* the layout is for.

| Property | Description |
|---|---|
| Displayed Type | The *BiskitDef* the layout is for. |
| Enabled | Whether this layout is currently to be used. Disabled layouts are shown in the layout tree in the left pane in red. |
| Unassigned Properties Display Location | Specifies how all unassigned *properties* will be displayed. Either ***S*how in Main Table** where the *properties* are shown in a table above the tabs section or **Shown in Property Group** where the *properties* are shown as the first tab in the tabs section with a name for the tab assigned by the user. |

The **Top Pane** also has the **Layout** toolbar which enables the user to edit, create and delete layouts as well as being able to preview the layout already defined.

For a complete description of the standard toolbar buttons read the Toolbar Button Standard Definition[15] chapter.

| Layout Toolbar Item | Description |
|---|---|
| Preview | This will display a preview of the current layout as defined. When in edit mode this preview will be up to date and you do not need to save first. The preview will display initially in read-write mode, but the user can change the mode using a toggle at the top of the view to see what the display would look like in read-only mode. Some information is only displayed in read-only mode. The information in the *properties* in the preview is constructed in a random manner to give the user an idea of what the layout would look like with data and is not read from the database. |

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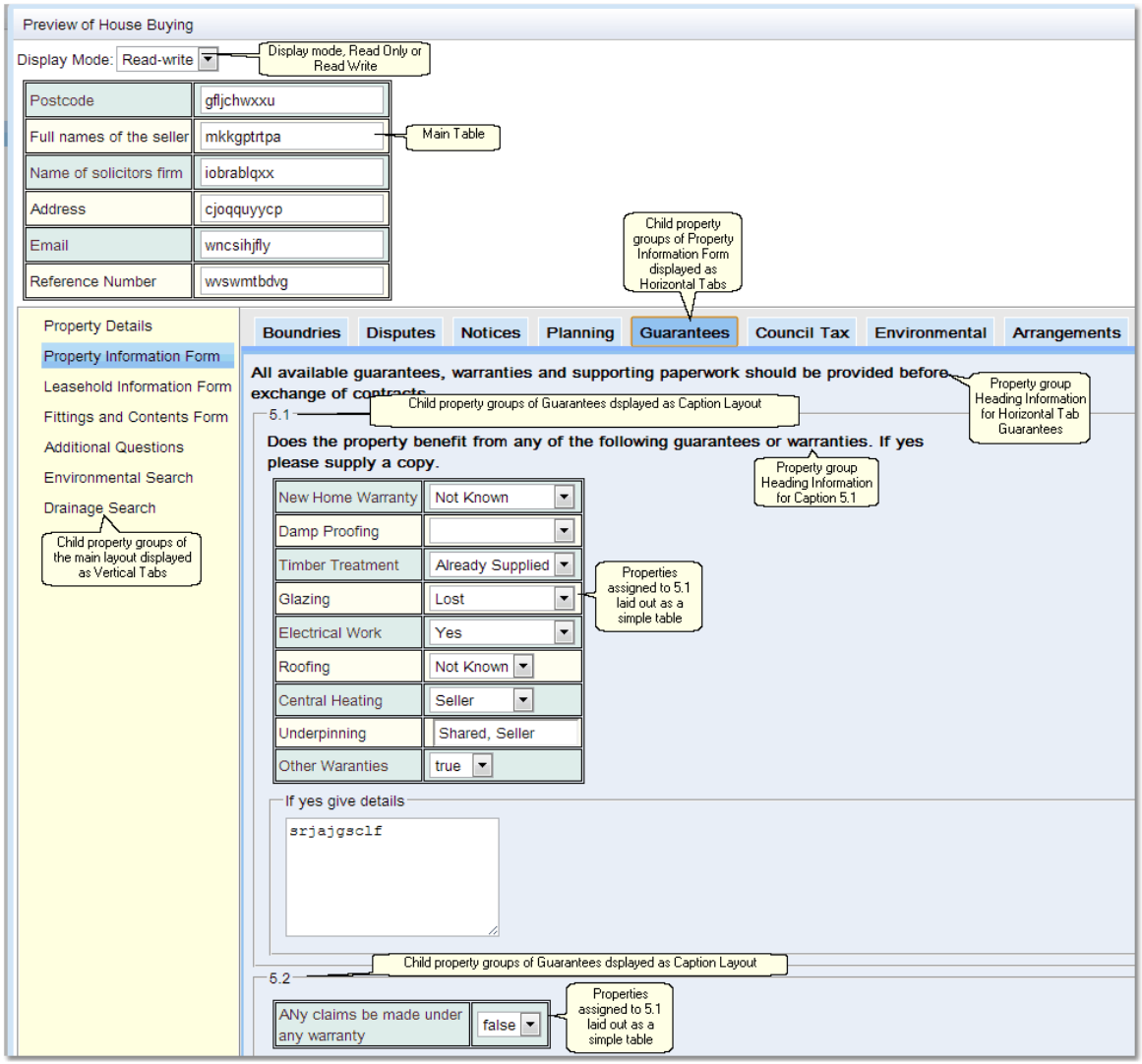
By pressing the **Preview** button a view of the current layout showing the different areas will appear. Use this preview to walk around the layout checking how it works.

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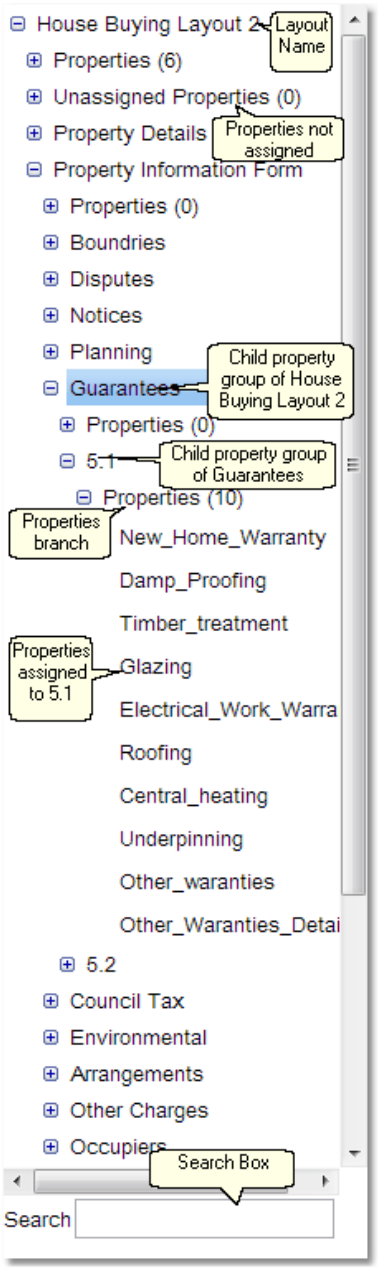
## Organisation Pane




This pane shows how the *properties* of a *Biskit* have been organised into **Property Groups** and child **Property Groups** as a tree structure.

The layout is defined at the top of the pane, the layout will have a **Properties** and **Unassigned Properties** branch.

**Property Groups** are then created When a **Property Group** is created it will automatically have a **Properties** branch which will initially be empty.

**Property Groups** can be reordered by dragging and dropping the group elsewhere within its parent.

To move a **Property Group** from its current parent to another parent they can be dragged and dropped or by using cut and paste. Cut the **Property Group**, select the new parent, paste the **Property Group**. Then reorder as above

The user in edit mode can move *properties* from one **Properties** branch to another by dragging and dropping. All the *properties* in a **Properties** branch can be moved by dragging the branch to a different **Properties** branch. Also *properties* can be dragged from a property list in the **Information Pane** and dropped into a **Properties** branch in the **Organisation Pane**.

*Properties* can be reordered within a **Property Group** by dragging and dropping the *properties*.

The search box can be used to find a *property*. Once the user starts typing a name into the search box, a list of possible *properties* will appear, as the user continues typing the possible list will reduce, until only one remains. The **Properties** branch containing that *property* will be expanded in the tree and the *property* will be highlighted.

If what has been typed does not match any possible *property* the search box will be outlined in red and the search text will also go red.

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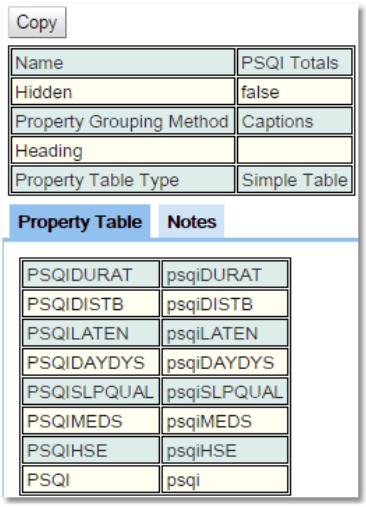
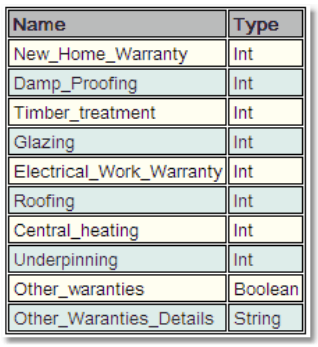
## Information Pane

The **Information Pane** will have information about the item that is currently selected in the **Organisation Pane**. There are three types of items that can be selected
1. A **Property Group**.
2. A **Properties** branch
3. A *property*




If a **Property Group** is selected then information about that group is displayed. Any *properties* associated with the **Property Group** are listed under the **Property Table** tab showing their **Name** and **Label**.
The **Notes** tab allows the user to define whether this **Property Group** contains a **Notes** field and/or a .
The **Copy** button allows the user put a copy of this **Property Group** into the buffer for later pasting.

| Information | Description |
|---|---|
| Name | Name of the **Property Group** |
| Hidden | Whether the **Property Group** should be hidden from view. |
| Property Grouping Method | How the child **Property Groups** of this **Property Group** should be grouped/displayed. **Vertical Tabs**, **Vertical Tabs (Sorted by Name)**, **Horizontal Tabs** and **Captions**. To see examples of these layout types look at the Preview[159] image above. |
| Heading | Any heading to be displayed with this **Property Group**. |
| Property Table Type | How **Properties** belonging to this **Property Group** will be displayed. **Simple Table**, **Multi Column Table**, **Radio Button Table** and **Custom HTML**. |




If a **Properties** branch to the tree is selected then the *properties* grouped here will be displayed as a list, showing their **Name** and **Type**.

If an individual *property* is selected then the *properties* **Label** will be viewed. This is so the user can see what will be written for this *property* in the layout.

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| Property Def | Preop Hernia |
|---|---|
| Show Full Detail | Show In Property Group Preop Hernia |

If the *property* selected is of type *Biskit* then there will also be an option of how to display the *Biskit* information. Either as a **Show Simple**, (as a single element in a table) or **Show in Property Group** with a name assigned by the user (treating the *Biskit* as the first **Property Group**. If the *Biskit* has a layout defined it will be used, otherwise all the *properties* will be displayed as a simple table.)

| Primary Key | 298 |
|---|---|
| Type | Biskit |
| Name | subjectStatus |
| Description | |
| Label | Subject Status |
| Tooltip | |
| Sort Order | 0 |
| Live | true |
| Min | |
| Max | |
| Attributes | ☑ Visible<br>☑ Editable<br>☑ Persistent<br>☐ Null Allowed<br>☐ Required<br>☑ Visible In Biskit Detail<br>☑ Visible In Biskit List<br>☑ Visible In Collection Editor |
| Rows | |
| Columns | |
| Group | |
| Storage Mechanism | Static |
| Automated Property Type | |
| Biskit Def | Subject Status |
| Component | ☐ |
| Biskit Property Type | To One |
| Reference Deletion Option | No Action |
| Default Value | |

If a *property* is selected from the unassigned *properties* branch the information from the Bakery[173] about the *property* is displayed for information. This information can **NOT** be edited here even if the layout is in edit mode. To edit the details of a *property* the user will need to go to the Bakery[173].

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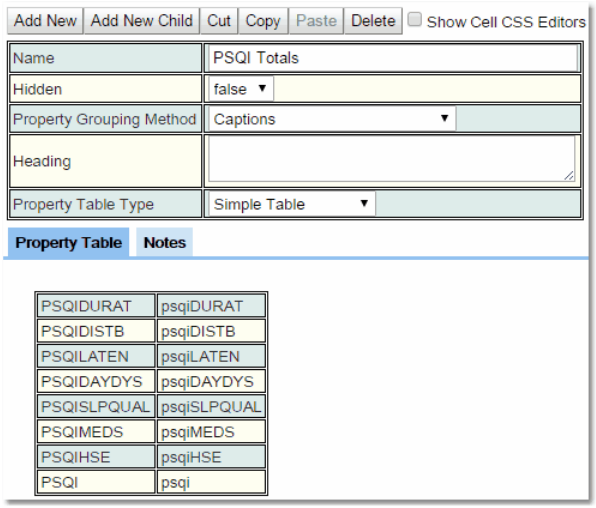
## Information Pane Edit Mode

On entering edit mode what is viewed in the **Information Pane** will vary depending on what is selected in the **Organisation Pane**.

If a **Property Group** is selected then the header information for the **Property Group** will be shown in an editable form. See the table[161] in the previous section for a description of the information displayed.




There will also be an edit toolbar.

| Property Group Toolbar Item | Description |
|---|---|
| Add New | Adds a new **Property Group** at the same level as the currently selected **Property Group**. |
| Add New Child | Adds a new **Property Group** as a child of the currently selected **Property Group**. |
| Cut | Cuts the currently selected **Property Group**, removing it from its current place in the tree and puts it in the edit buffer overwriting any current contents. |
| Copy | Takes a copy of the currently selected **Property Group** and puts it in the edit buffer overwriting any current contents. |
| Paste | Pastes the current buffer contents as a child of the currently selected **Property Group**. When pasting a **Property Group** care needs to be taken if the **Property Group** has any *properties* associated with it. *Properties* can only appear once in a layout and the editor will remove *properties* that clash with the pasted *properties*. |
| Delete | Deletes the selected **Property Group**. Any *properties* associated with that **Property Group** will be moved to the **Unassigned Properties** branch. |
| Show Cell CSS Editors | This will display in each cell of the *properties* a little icon allowing the user to start up a CSS editor for that cell. For more on the CSS editor read the section on CSS Editors[156]. |

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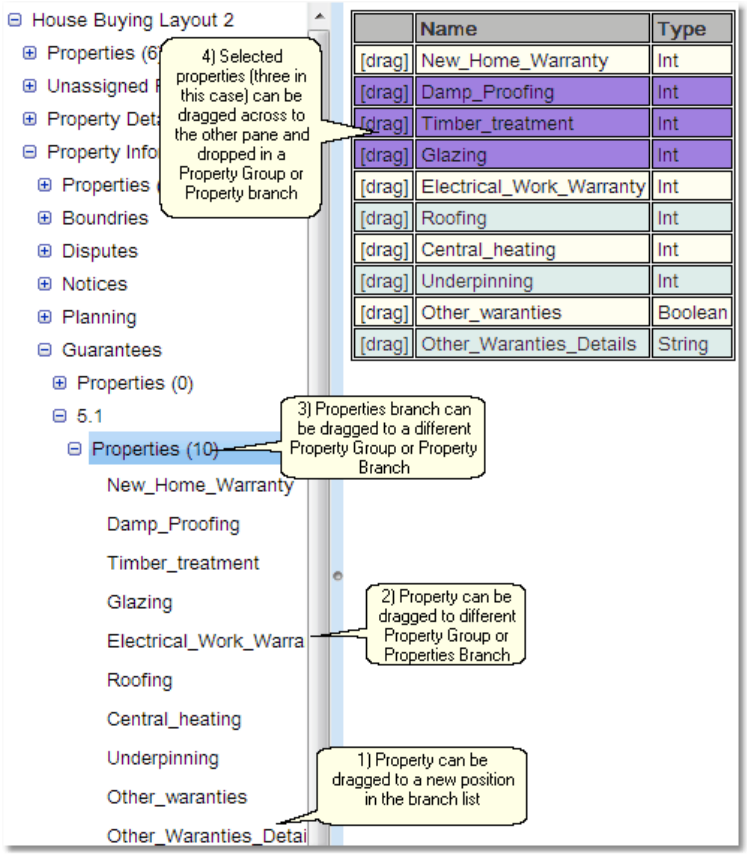
## Moving Properties

If a **Properties** branch is selected then a list of *properties* will be shown in the **Information Pane**.
There are four ways to move *properties* within a combination of the **Organisation Pane** and the **Information Pane**

1. An individual *property* can be selected in the **Organisation Pane** and dragged to a new position in the list.
2. An individual *property* can be selected in the **Organisation Pane** and dragged and dropped into a different **Properties** branch.
3. A **Properties** branch can be selected in the **Organisation Pane** and dragged and dropped into a different **Properties** branch, all the *properties* in the dragged branch will then transfer to the new branch.
4. In the **Information Pane** using shift and ctrl, a number of *properties* can be selected from the viewed list and dragged across to a **Properties** branch in the **Organisation Pane**.

In all the above cases dropping the *properties* on a **Property Group** name will place the *properties* in the **Properties** branch for that **Property Group**.

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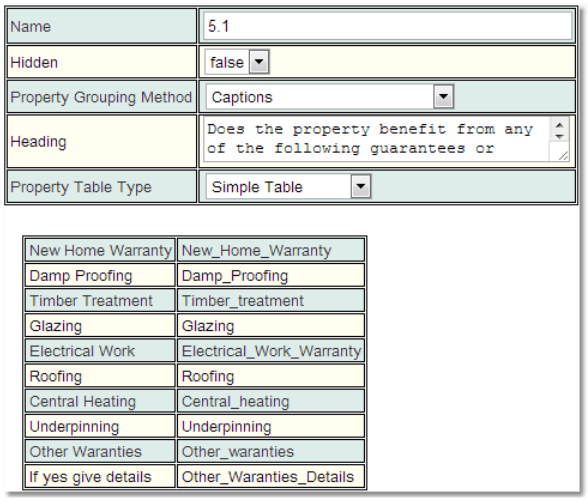
## Property Table Types

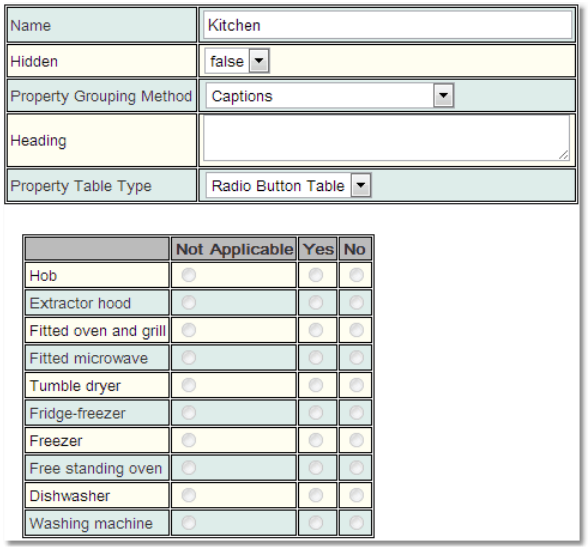
There are four different ways to display a list of *properties*.

1) Simple Table




Information in a **Simple Table** will be displayed with the *property* label and the *property* value.

2) Radio Button Table




Information in a **Radio Button Table** is displayed showing the property labels and then a choice of values. This type of table is limited to the following

a. All *properties* must be of the same type.
b. They must be one of the following types:
   i. *Biskit* valued.
   ii. *Mapped Integer*[251].
   iii. *Mapped String*[251].

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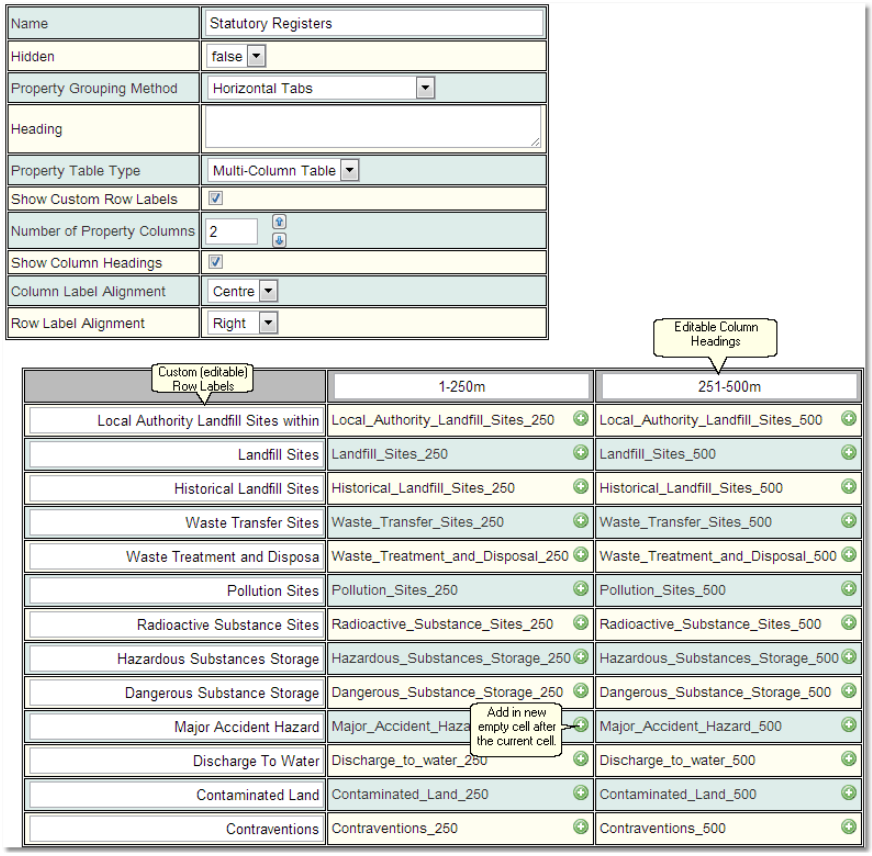
3) Multi-Column Table




Information in a **Multi-Column Table** will be displayed with the *property* label and the *property* value. If multiple columns are being displayed only the labels of the *properties* required for the number of rows being used will be displayed.

| Multi-Column Table | Description |
|---|---|
| Show Custom Row Labels | Allows the user to edit the row labels. |
| Number of Property Columns | The number of columns used to display the *properties*. The first *property* in the list will have its value displayed at the top of the first column, the next *property* value at the top of the next column and so on until the columns are filled up. The next available *property* value will then be displayed in the second row of the first column, *property* values will then fill in the second row before moving onto the next row and so on until all *property* values have been displayed |
| Show Column Headings | Displays column headings into which the user may place their own labels. |
| Column Label Alignment | Defines whether the column labels are left, centre or right justified. |
| Row Label Alignment | Defines whether the row labels are left, centre or right justified. |
| | Adds a new empty cell after the current cell. Useful for filling out tables which have a variable number of rows. |

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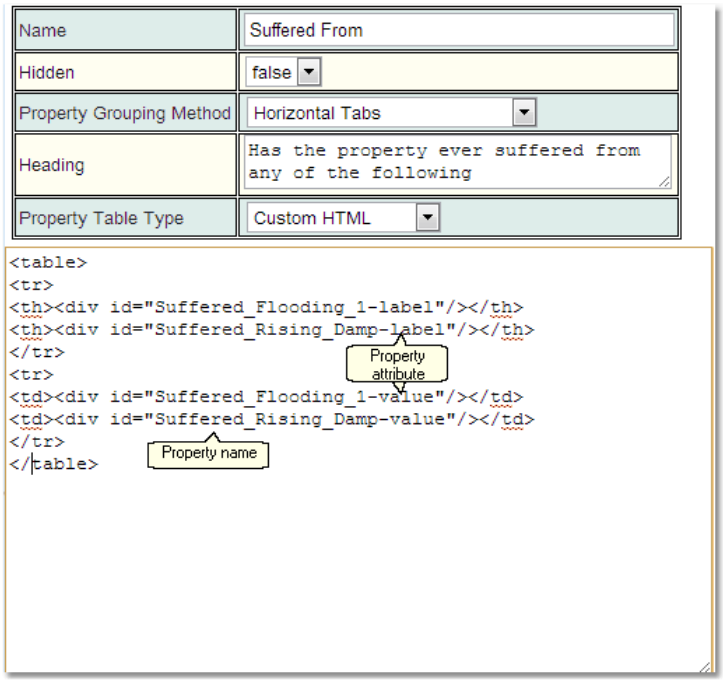
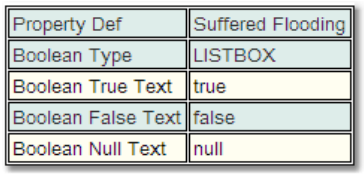
4) Custom HTML

Enable building of a table structure using HTML.



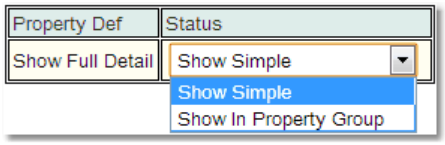

## Other Display Options

Boolean *properties* have additional options, click on the *property* to get




The display type can be either a list box or a check box and the user can define the text to be used for **True**, **False** and **Null**.

Biskit *properties* have additional options, click on the *property* to get




The details of the *Biskit* can be displayed either as a simple table of all the *properties* (**Show Simple**) or in a separate **Property Group** (**Show in Property Group**) using the current layout type, **Horizontal**, **Vertical** or **Caption**. Also if a layout has been defined for the *Biskit* then the layout definition will be used for the *properties* of the *Biskit*.

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## Notes

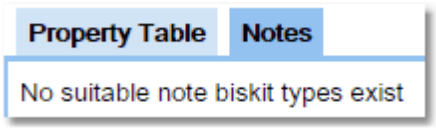
The user can add areas to the layout which enable the storing of notes. In order to do this a *BiskitDef* needs to be created to hold the note information. This *BiskitDef* must have at least two *properties*. Optionally the user can also define a *property* to hold the **Category** of note to be stored.

| Property Type | Description |
|---|---|
| String | This *property* will hold the **Note** information. If the **StringPropertyType** is **HTML** then the note will support **Rich Text Format**. |
| Biskit | This property will define the parent *BiskitDef* that the **Note** is for. This *property* must be an **Automated Property Type**, set to **Create and Update**, the *Biskit Def* must be set to the parent *Biskit Type* and the **Biskit Property Type** must be set to **To One**. |
| Biskit | This property will define the **Category** *BiskitDef* that the **Note** is associated with. If used the **Category** is stored with the note and is used to determine which **Waterfall** the note will be displayed in. |

Other *properties* may be added to the *BiskitDef* such as automated properties to hold the created and updated time, the creator, the updater and the version number as required.

There may be more than one **Note** *BiskitDef* if required. A single **Note** *BiskitDef* can be used to hold notes created in multiple places in the layout, or the user may define a different **Note** *BiskitDef* for each place notes are going to be added, or a combination of both methodologies.

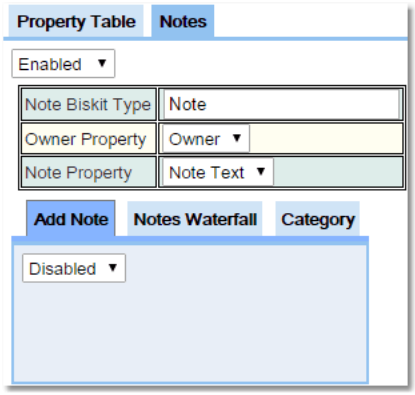
Once an approprite BiskitDef has been created the Notes tab will change from




to

use the drop down to enable **Notes.**

Once enabled the user will see the following in the **Notes** tab.




**Note Biskit Type**: This needs to be set to the *Biskit Type* that will hold the note information.
**Owner Property**: This needs to be set to the *property* that points to the owning *Biskit Type*. This is the *Biskit Type* that the notes can be attached to in the Layout Editor.
**Note Property**: This needs to be set to the *property* that will hold the note information.

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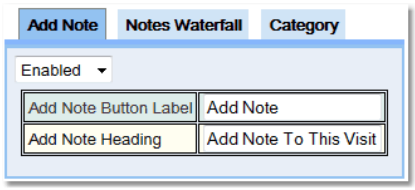
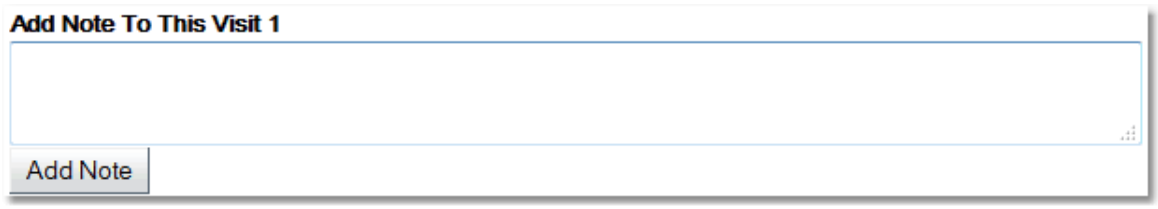
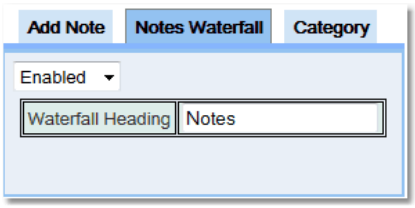



**Add Note Button Label:** This defines the string to be put on the button that will add the note to the database.
**Add Note Heading:** This defines the string that will be used as a heading to the add note area.
This information is used to determine how the add note area is defined. Below you can see an example of an add note area.




So far the area to write and add notes has been defined. Next the user needs to define an area to display all the notes that have been written to the DB, this is called a **Notes Waterfall**.




Once the **Waterfall** is enabled the user can define what heading will appear above the **Waterfall** in the layout.

Finally notes can be stored under a number of **Category**'s. In order to set up the **Category**'s a *hierarchical BiskitDef*[224] needs to be defined, this is where a parent can have many children of the same type of *BiskitDef* and a child will have only one parent. The minmum properties would be:

| Property Type | Description |
|---|---|
| String | This *property* will hold the **Category** name. |
| Set | This property will point to the children's *BiskitDef* as a Set. These will be of the same *Biskit Type* as the parent. |
| Biskit | This property will point to the parents *BiskitDef*. This will be of the same *Biskit Type* as the child. |

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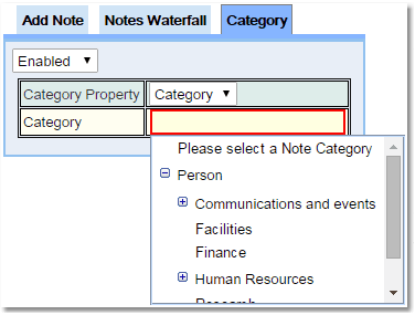


Once the **Category** is enabled the use will need to set the **Category** *property*. This is the property on the **Note** *BiskitDef* that points to the **Category** *BiskitDef*.

Then the user will need to define which of the **Category**'s the current **Notes** section will save **Notes** as. Any **Waterfall** enabled in this **Notes** section, will only display **Notes** of this **Category.** If no **Category** is enabled then the **Waterfall** section will display all **Notes** no matter what their **Category**. An **Add Note** can define a **Category** to create a **Note** under in one place in the **Layout** and a **Notes Waterfall** can be enabled with that **Category** defined somewhere else in the **Layout** if required.
*Permissions*[251] may be assigned to **Category**'s to stop/ allow viewing/editing of notes. A *Permission* assigned to a **Category** in a hierarchy will be inherited by all its children.

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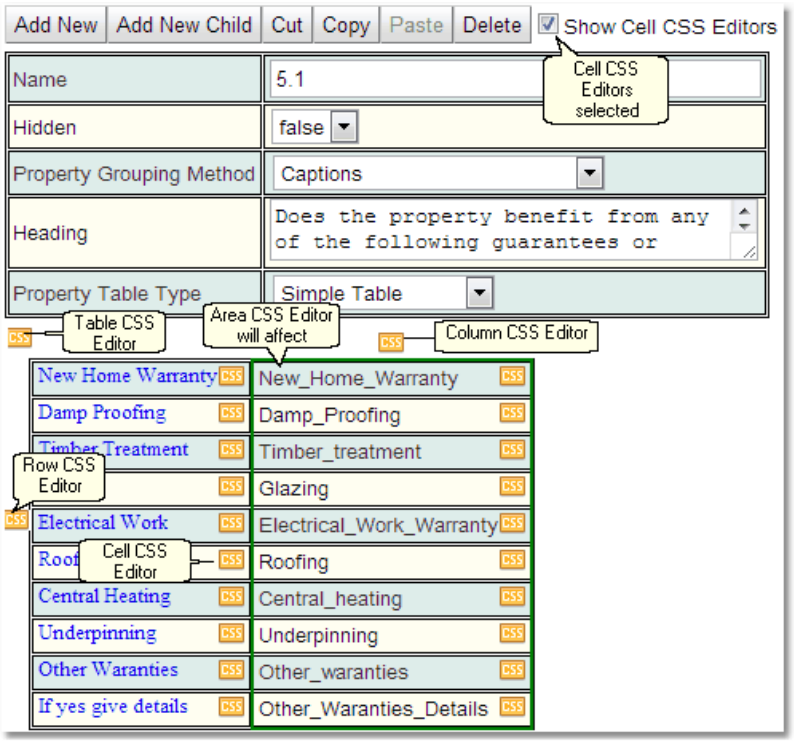
## CSS Rule Editors

The user can define their own CSS information for each Table, Row, Column or Cell using the **CSS Editors**. These editors are displayed as small icons with CSS written on them. In order to bring up the icons:

1. For a row, move the cursor to just to the left of the start of the row.
2. For a column, move the cursor to be just above the column.
3. For a table, move the cursor to be just outside the top left hand corner of the table.
4. For a cell, check the **Show Cell CSS Editors** box in the **Property Group Toolbar**.

When selecting a **CSS Rule Editor** the area to be affected will have a green border.




In the example above the first column has had the text colour set to Blue, the font-family set to Times New Roman and the font-size set to small.

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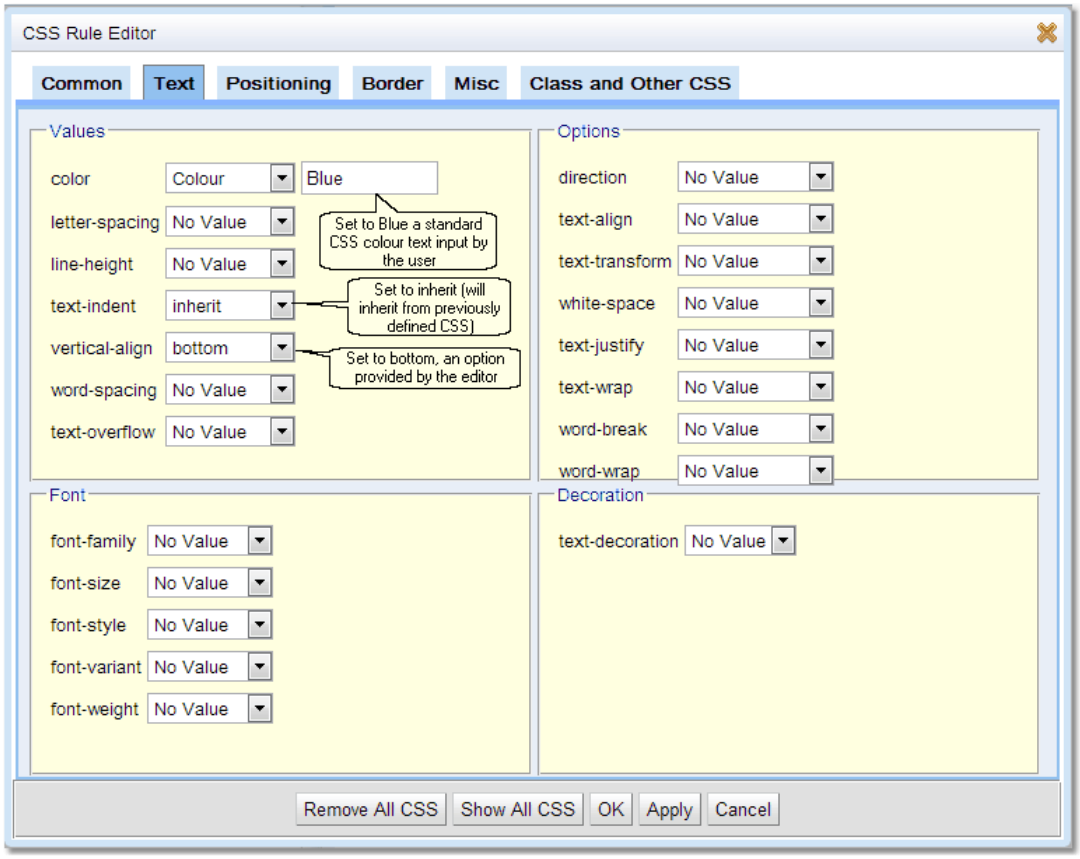
When the **CSS Rule Editor** is opened up:




The possible CSS values are organised into different tabs to help with finding the required CSS value. When the drop down button is pressed for a value the user will have a choice of options. Some will require the user to input the appropriate CSS string (see Colour above). The user can also specify inherit which means the CSS will be inherited from previously defined CSS by the user, this could be in Global Preferences[144] or elsewhere in **Exprodo DB** where CSS can be defined.

For a complete description of the standard toolbar buttons read the Toolbar Button Standard Definition[15] chapter.

| CSS Editor Toolbar Item | Description |
|---|---|
| Remove All CSS | Removes all CSS that the user has applied using the editor to this particular object. |
| Show All CSS | Shows in a pop up window the CSS that has been defined for this particular object. |

For more information and help on using CSS and HTML a site we recommend is http://www.w3schools.com/

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## 4.9 Bakery

**Exprodo DB** is built on Exprodo, a web-based system that is designed to be able to display and edit the contents of a database. To be able to do this, **Exprodo** allows the building of definitions of the data in the database. In other words, while **Exprodo DB** has a built-in set of data types that it handles,the user can add extra data types and modify the predefined data types by adding new properties and change the way existing properties are displayed.

As well as being able to create definitions of the data in a database so that the user can see and edit the database contents, **Exprodo** provides additional facilities to help with interaction with that data:

- Automatic Emails 116 to be sent in response to data being changed
- Customisable Menus 129
- A Permissions 97 system based on very adaptable Conditions 17
- Dynamic reporting tools.

Each of these facilities makes heavy use of the fact that the data types themselves are defined in the database. It lends itself to providing a very flexible system. Therefore, the very heart of the system is the means by which one can view and modify the definitions of the data types, and that is precisely what the *Bakery* 250 does.

The data types themselves are called *Biskit Types* 250, and the definition of the content of a *Biskit Type* is known as a *BiskitDef* 250. Each *BiskitDef* defines certain information, such as its name, the labels used to display that name, the database table that contains the *Biskit Type*, and how to display the name of its *Biskits* 250 *(*individual occurrences of the *Biskit Type.* i.e. User is a *Bisket Type*, Joe Bloggs would have a *Biskit* in the database defining his information as a specific occurrence of the User *Bisket Type*, with the *properties* 252 of that *Biskit* filled in with his specific information.). It also stores a list of *property* definitions, with each *property* definition defining its *Biskit Type*, how it's stored in the database, how to display the label for the property, the tool tip text to be displayed when the mouse hovers over each *property* value and a number of other aspects of the *property*.

When saving *Biskit Types* and *properties*, **Exprodo DB** does check that reserved words have not been used for column names, table names, *Biskit Types* and *property* names. There are currently over eight hundred words such as Select, Into, From, Start, Full which are reserved. The system administrator can switch this checking off in Global Preferences, General 148 section, but this is not advisable.

The *Bakery* allows these things to be customised, as well as adding the users own *BiskitDefs* so that **Exprodo DB** can be used to interact with the users own data.

### 4.9.1 Property Storage Mechanisms

A database has many tables, with each table having many columns. When a new *Biskit* 250 is created, a new row is added to the *Biskit's* table, containing its *properties* 252. When a new *property* is added to a *Biskit* in **Exprodo DB**, one would normally also add a new column to the appropriate database table. However, modifying tables like this is not something that all users would be comfortable doing.

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**Exprodo DB** helps with this by creating table columns automatically, but it will not remove unused columns, and it will not change the *Biskit Type*[250] contained in a column. This provides some protection against accidental destruction of data while changing the *Biskit* definitions, but also means that getting the configuration right does have some difficulties. This is particularly true if there needs to be a change of the type of data stored by a *property*, which has to be handled by creating a new column for it.

However, there is an alternative that does not involve creating a new table column when adding a new *property*. **Exprodo DB** supports what are called **Indirect** properties which are stored in a separate table in such a way that new *properties* do not require changing the table structure.

In all, there are three *property* storage mechanisms: **Static**, **Dynamic** and **Indirect**. This table compares them:

| Comparison | Static Properties | Dynamic Properties | Indirect Properties |
|---|---|---|---|
| Description | Built-in to **Exprodo DB** | Created using the *Bakery*[250] | Created using the *Bakery* |
| Structure | Each *property* in a column in the *Biskit's* main table | Each *property* in a column in the *Biskit's* main table | One row added to the *Biskit's* indirect *properties* table for each indirect *property*. |
| Adding new property | Not possible without a new version of **Exprodo DB** | • Add in the *Bakery*<br>• Ask the *Bakery* to update the database schema<br>• Tell **Exprodo DB** server to reload the data definitions when you have finished making all changes | Add in the *Bakery* |
| Advantages | • Efficient storage and retrieval<br>• The fastest access mechanism | • Efficient storage and retrieval<br>• Not quite as fast as static properties | • Does not require table structure to be changed to add a new indirect *property*<br>• Harder to make mistakes and get confused |
| Disadvantages | Cannot be changed without new version of **Exprodo DB** | Need to be aware of database columns and their *Biskit Types* | Much less efficient storage and retrieval than the other property types |

Users of **Exprodo DB** cannot create or delete **Static** *Biskits* or *properties* but can change some of the *meta properties*[251] of both the *Biskit* and the *properties*, such as the labels, tool tips, whether required and default values.

Users should be using dynamic *properties* rather than indirect *properties*, unless they really do not wish to change the **DB Schema**, and are happy with the speed of the indirect *properties*.

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### 4.9.2 Biskit Definitions

It can be a bit confusing to talk about definitions of *properties*[252]. So let's start by using an example, and looking at the definition of the **Session** *Biskit*[250] that is used to store information about who is using **Exprodo DB**. A **Session** has the following *properties*:

| Name | Data Type | Description |
|---|---|---|
| user | *Biskit* | The user whose session this is |
| started | Date Time | The date/time when this session started |
| lastUsed | Date Time | The date/time when this session was last used |
| IPAddress | String | The IP address of the user's computer |
| sessionID | String | An ID used to represent the session when the user's web browser sends requests to the server |
| userAgent | String | The web browser's reported user agent information. This tells you which web browser they are using. |

Now, the *BiskitDef*[250] for a **Session** must contain information about each of the above six *properties*. For each one, it has to know the Data Type, its name, the label used to display it and so on. However, the **Session** *BiskitDef* must also store *meta-properties*[251] of **Session** itself, such as its type ("Session"), its database table name and the text used to display the name "Session" in a number of contexts.

There are quite a few different types of property that a *Biskit* can store, and these are described in the next section, Property Definitions[180]. The *meta-properties* of a *Biskit* are much simpler, and here is what they look like in the editor:

| | |
|---|---|
| Type | UserGroup |
| Parent | None |
| Group | |
| Primary Key | 7 |
| Version | 0 |
| Name Property | name |
| Sort Property | Use default sorting |
| Version Property | No version number |
| Created Property | |
| Updated Property | |
| Creator Property | |
| Updator Property | |
| Format | |
| Abstract | ☐ |
| Enumerable | ☑ |
| Hierarchy Property | |
| Label Lower | user group |
| Label Upper | User Group |
| Labels Lower | user groups |
| Labels Upper | User Groups |
| Null Value Label (Read-Only) | Use default |
| Null Value Label (Read-Write) | Use default |
| Tooltip | |
| Visibility | Users |
| Storage Mechanism | Static |
| Shareable Table | Not shareable with sub-types |
| Allows Deletion While Referenced | Does not allow deletion |
| Table Name | user_groups |
| ID Column Name | id |

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Here is a description of what each *meta property* is for:

| Name | Data Type | Description |
|---|---|---|
| Type | String | This is the internal string that represents the *Biskit's* type. |
| Parent | BiskitDef | Some *Biskit's* extend others (in the programming subclass sense) and this indicates the *Biskit Type* that is the parent of this one. |
| Group | String | Only used by the *Bakery* 250 itself, use any group name required on a *BiskitDef*. Then filter the *BiskitDefs* that are displayed by setting a filter *Biskit* group. |
| Primary Key | Integer | This is the unique database identifier for the *BiskitDef*. |
| Version | Integer | Used internally to manage changes to the *BiskitDef*. Increased by one every time a change is made. |
| Name Property | String | The name of a *property* on the *Biskit* that can be used to represent that *Biskit*. This is not used if **Format** is specified. Important to do this or the **Exprodo DB** chooses the name for each instance of the *Biskit* that is created. |
| Sort Property | String | The name of the *property* that should be used to sort *Biskits* of this type. |
| Version Property | String | The name of the *property* that should be used to hold the version number of the *Biskit*. Only those *properties* of type **Int** with an **Automated Property Type** of **Create & Update** will be used. |
| Created Property | String | The name of the *property* that should be used to hold the created date and time of the *Biskit*. Only those *properties* of type **Datetime** with an **Automated Property Type** of **Create** or **Create & Update** will be used. |
| Updated Property | String | The name of the *property* that should be used to hold the last modified date and time of the *Biskit*. Only those *properties* of type **Datetime** with an **Automated Property Type** of **Update** or **Create & Update** will be used. |
| Creator Property | String | The name of the *property* that should be used to hold the creator of the *Biskit*. Only those *properties* of type **Biskit** with **Biskit Def** set to **User,** with an **Automated Property Type** of **Create** or **Create & Update** will be used. |
| Updator Property | String | The name of the *property* that should be used to hold the updator of the *Biskit*. Only those *properties* of type **Biskit** with **Biskit Def** set to **User,** with an **Automated Property Type** of **Update** or **Create & Update** will be used. |
| Format | String | Lets the user specify a format for representing the *Biskit* when there isn't a single *property* that contains the name. See below 178 for more details. |
| Abstract | Boolean | True if there can be no instances of this *Biskit Type*, only instances of subtypes. |
| Enumerable | Boolean | True if there are likely to be a large number of *Biskits* of this type, too many for display in a list. |

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| | | |
|---|---|---|
| Hierarchy Property | String (property name) | Some *Biskits* represent a hierarchy. For example, there might be a **Location** *Biskit,* where the **Location** "Oxford" is a child of the **Location** "England", which is a child of "United Kingdom" which is a child of "Europe".<br>A hierarchy is a *Biskit* that has a *property* containing a *Biskit* of the same type, representing the parent in the hierarchy, and also a *property* containing a set of its children. So, Europe has children "United Kingdom", "France", "Germany" and so on.<br><br>When a user selects a *Biskit* from a hierarchy, they are presented with a "tree" widget making it easier for them to choose the right item. For this to work, **Exprodo DB** needs to know which *property* contains the children. This must be a **OneToMany** *Biskit property*. |
| Label Lower | String | Text used to display the *Biskit Type*, when the context calls for a lower case label. |
| Label Upper | String | Text used to display the *Biskit Type*, when the context calls for an upper case label. |
| Labels Lower | String | Text used to display the *Biskit Type*, when the context calls for a plural lower case label. |
| Labels Upper | String | Text used to display the *Biskit Type*, when the context calls for a plural upper case label. |
| Null Value Label (Read Only) | String | The label to show for *Biskits* of the type represented by this *BiskitDef* when that *Biskit* is null, and we're displaying in a read only context. |
| Null Value Label (Read Write) | String | The label to show for *Biskits* of the type represented by this *BiskitDef* when that *Biskit* is null, and we're displaying in a read write context. |
| Tooltip | String | Text to display as a tool tip describing this type of *Biskit*. |
| Visibility | Nobody, Root, Admins, Users or Everybody | Indicates who can see that this *Biskit Type* exists. |
| Storage Mechanism | Static or Dynamic | Indicates whether this *BiskitDef* is defined statically, in the source code for **Exprodo DB**, or dynamically in the *Bakery*. |
| Shareable Table | Boolean | **Shareable with sub-types** if you want dynamic sub-types to be able to share this *BiskitDefs* database table. |
| Allows Deletion While Referenced | Boolean | **Allows Deletion** if you want *Biskits* of this type to be deletable even while something references them. |
| Table Name | String | The name of the database table for storing instances of this *BiskitDef*. The table name for a static *BiskitDef* cannot be modified, since it is defined in the source code for **Exprodo DB**. Also, not all static *Biskit Types* will have a table associated with them, for example if they are *abstract* or if they are only ever used as components of another *BiskitDef*. |

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| | | |
|---|---|---|
| ID Column Name | String | The name of the column which provides the primary key into the table. In a **Master-Slave** combination these must be different in the **Master** and each **Slave**. |

## Biskit Format

Set the **Name** *property meta-property* of a *Biskit* to specify the name of the *property* that should be used to represent the *Biskit*. when something more complex than just the label is required. For example, a user has a login name, a given name and a family name, but any one alone can not be used to display the person's name. Instead, a combination of them is required.

Biskit Format Definition

The syntax of the format is rather convoluted, and there will soon be an editor that will let you configure it without having to understand the syntax.

## Dynamic Biskits

Use the *Bakery* to create new *Biskit* definitions. These will be *dynamic Biskits*. The user can use **Exprodo DB** to handle create, read, update and delete values in any table with the following restrictions:

- There must be an integer-valued primary key
- The new dynamic *Biskit* must contain only dynamic *properties*. This means that, if an extra *property* is added to the dynamic *Biskit*, the database table must contain a column for it. If the column doesn't already exist, then **Exprodo DB** can create the column for the user, or the user can create it.

**Dynamic** *Biskits* can be used in exactly the same way as **static** *Biskits*.

## Creating Biskits

*Biskits* can have links to each other via *properties*, also some *meta-property* values of a *Biskit* depend on having appropriate *properties*, which means that creating *Biskits* and their *properties* is not a linear event. i.e. the user cannot start at the beginning and hope to move step by step to the end saving completed *Biskits* as they go. Sometimes the user will need to create a *Biskit* with its *properties*, save it with errors, create a second *Biskit*, save it with errors, go back to the first *Biskit*, set up new information now available in the first *Biskit* because the second *Biskit* has been created, re save the first *Biskit*, go back to the second *Biskit*, update that with information from the first *Biskit* and save. This means when creating your own *Biskit's* make sure there is a plan on how they are going to connect together.

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## Inheritance

*Biskits* can inherit from other *Biskits*, inheriting all their *properties* To do this set the **Parent** *meta-property* to be the *Biskit* the new *Biskit* is inheriting from.

When a *Biskit* inherits from another *Biskit* it needs to be specified whether both *Biskits* will share the same table or whether the new *Biskit* will have a table of its own for its own *properties* (those it does not share with the parent). This is done by setting the **Share Super Type Table** *meta-property*. A *Biskit* can only share the table of the *Biskit* it inherits from, if that *Biskit* has the **Shareable Table** *meta-property* set to allow it.

This may seem very similar to copying a *Biskit*, but there are certain major differences:

- When editing the child *Biskit* the parents *properties* are not seen.
- After adding a *property* to the parent the child automatically has access to the new *property*.
- When changing any *meta-properties* of *properties* in the parent the child *Biskit* will automatically inherit the changes. (e.g. Default Value).
- A *property* in the child cannot be created using the same name as a *property* in the parent.
- If the child *Biskit* has a sibling (same parent *Biskit*) and they all share the same table, do not create *properties* of the same name in both child and sibling. (Currently there are no checks for this but it will cause problems in the database).
- Automatic emails applied to a super-type will automatically apply to any sub-type.
- *Permissions* 251 applied to a super-type will automatically apply to any sub-type but may be overridden in the sub-type.

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### 4.9.3 Property Definitions

A **PropertyDef** is the definition of a *property*[252] on a *Biskit*[250]. In the example of a **Session**, described in Biskit Definitions[175], we saw that a **Session** has 6 *properties*. Therefore, the *BiskitDef*[250] describing a **Session** contains 6 **PropertyDefs**.

A **PropertyDef** itself has *properties*. For example, it needs to record the name and type of the *Biskit property* it represents. There are quite a few different *property* types:

| Type | Description | Type-Specific Content |
|---|---|---|
| Biskit | *Properties* of type *Biskit* contain a *reference*[252] to another *Biskit*. | See Biskit Property Definitions[185]. |
| Boolean | Contains a true/false value | See Boolean Property Definitions[186] |
| Date | Contains a date without a time element | None |
| DateRange | Contains a range of date/time values | None |
| Datetime | Contains a date and time | None |
| Double | A floating point number | See Double Property Definitions[187] |
| Int | The *property* contains a 32-bit signed integer. This may be interpreted via a drop-down selector if the **PropertyDef** indicates this is a Mapped Integer[188], and may allow you to set multiple values if it is a Bit Set[190]. | See Integer Property Definitions[188]. |
| JavaEnum | The *property* contains a value that is from an enumeration defined in the source code. This is represented by a drop-down list. | See Java Enum Property Definitions[191]. Must specify the Java Enum Definition[191]. |
| Long | The *property* contains a 64-bit signed integer. Javascript does not directly support 64 bit values, and so long *properties* may cause performance problems because **Exprodo DB** has to emulate the behaviour of a 64 bit integer in the browser. | None |
| Set | The *property* contains a set of items. The **PropertyDef** also needs to define the type of the data contained in the set. | See Set Property Definitions[192]. |
| String | A text *property* value. The value may be constrained, by specifying a Mapped String[195], in which case the value would be edited using a drop-down list. Otherwise, it will be a free text entry. | See String Property Definitions[194]. |
| StringEnum | A *property* that contains a string constrained by a String Enumeration[197]. Note that these *properties* are deprecated and may be removed in a future version of **Exprodo DB**. | See String Enum Property Definitions[196]. Must specify the String Enumeration[197] |
| UserDefined | Used when the actual type isn't known in advance. Normally used only for indirect *properties*. | None |

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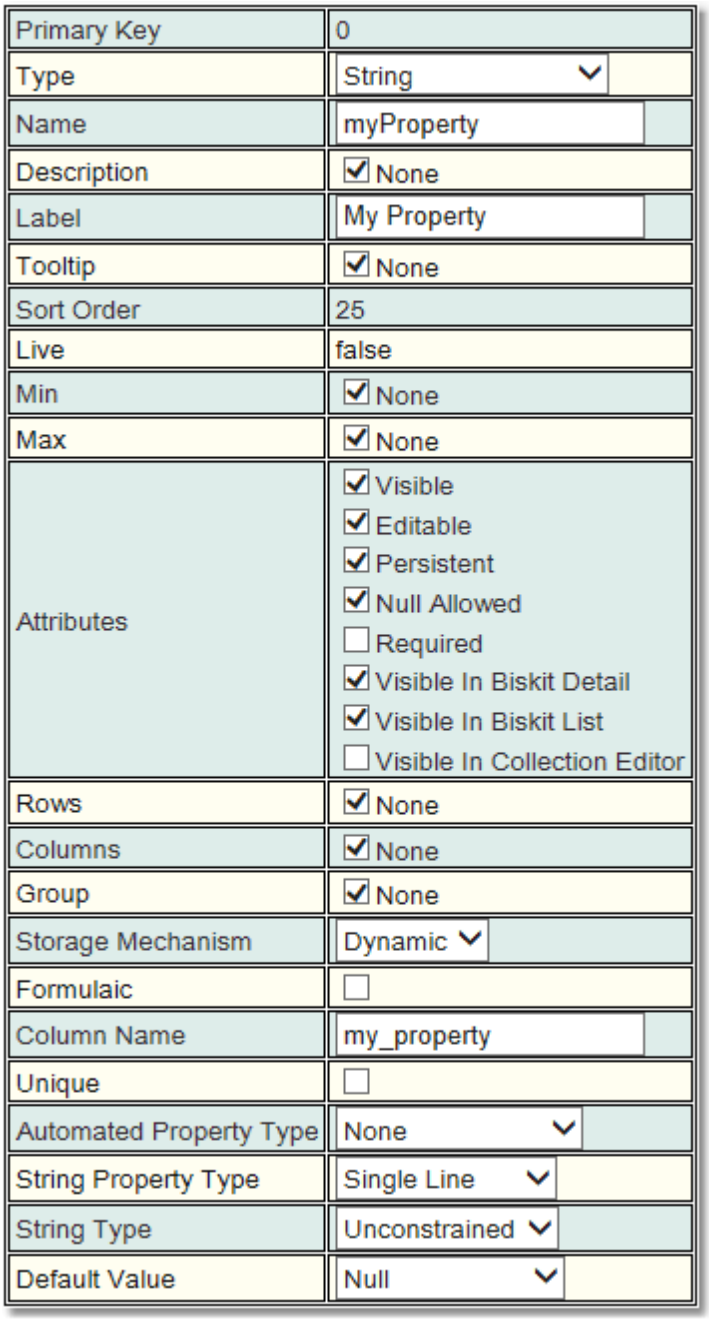
The different *property* types have different requirements about what information must be stored. For example, an integer *property* needs to specify whether it is to have values constrained by being a Mapped Integer[188] or a Bit Set[190], and in both cases in needs to know which particular Mapped Integer[188] should be used. But other *property* types do not need to know anything about *Mapped Integers*[251].

The requirements of the individual *property* types are shown in the following sections, the rest of this section will focus on the *properties* they have in common.

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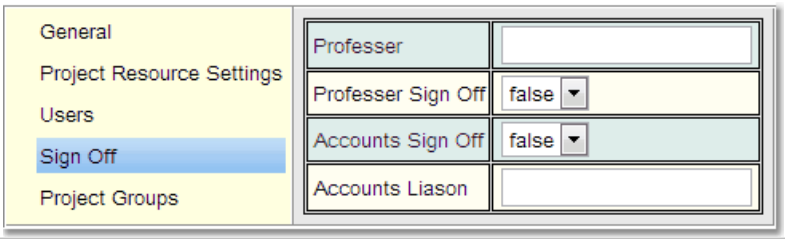
| Name | Description |
|---|---|
| Primary Key | This is the database ID for the **PropertyDef**. This cannot be changed, it is only for information purposes. |
| Type | The type of the *property*, integer, long, date etc |
| Name | The name of the *property*. This must be unique amongst all the *property* definitions on its *Biskit*, and contain only letters, numbers and the underscore. In particular, this cannot contain spaces. |
| Description | A description of the content of this property. This is only used for display in the *Bakery* 250 so that anybody using the *Bakery* will be able to see this text. It's not used anywhere else. |
| Label | This is the text used to display the *property* name. This is used whenever a *Biskit's* detail is displayed, with each *property's* label show before its value. |
| Tooltip | This is a tool tip that should be displayed whenever the mouse hovers over this *property* when it is being displayed or edited in a *Biskit*. |
| Sort Order | Used to change the order in which *properties* are displayed. This cannot be modified directly. Instead, *property* sort order is modified by drag-and-drop in the *Bakery*. |
| Live | Used internally. |
| Min | The minimum value the *property* can take. This is only used for numeric and string values. For numeric properties, the minimum should be a number representing the minimum value the *property* should have. For string *properties*, the minimum should be the minimum length of the string. If a minimum is set the string is automatically required. |
| Max | Similar to **Min**, this specifies the maximum value the *property* can take and is only used for numeric and string values. |
| Attributes | These are defined in a separate table, below. |
| Rows | The number of rows used to display the value. Particularly useful for multi-line string values. |
| Columns | The number of columns used to display the value. Particularly useful for multi-line string values. |
| Group | This can be any text required. In some contexts, *Biskits* are displayed with their *properties* in separate groups. In that case, it's the **PropertyDef's** *Group* string that defines the group that each *property* belongs to, and the text that should be used to name that group. If this is used, when viewing a *Biskit,* separate tabs each with the appropriate group name will be used to display the properties.<br>This *property* is used if no layout has been defined in the layout editor for this *Biskit Type* 250. The **Project** *Biskit* will always use this *property* for its layout.<br>  |

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| | |
|---|---|
| Storage Mechanism | Indicates whether the *property* is static, dynamic or indirect. See Property Storage Mechanisms 173 for more information. |
| Formulaic | Dynamic only. Allows a formula to be entered to calculate the value of this *property*. See the section on Formulae 197 for more details on the formatting. |
| Column Name | Only required for dynamic *properties*, this is the name of the database column used to hold the *property*. |
| Unique | Only required for dynamic *properties*, this indicates whether the value stored in this *property* should be unique. If it is, then when **Exprodo DB** is asked to generate SQL code to update the database schema, it will add the necessary commands to tell the database that the column contains unique values. This will make it illegal for the same non-null value to be present twice. |
| Automated Property Type | This specifies whether the *property* is automatically assigned a value, and when. The potential values are: **None, Create, Update or Create & Update.** If a property has a value other than **None** then the property will not be viewable when a *Biskit* is being edited. |
| Default Value | The value the user will see on creation. If this value is outside the **Min** and **Max** values above then the user will have to update before saving. |

The *attributes* on a *PropertyDef* are all boolean values as follows:

| Name | Description |
|---|---|
| Visible | Indicates whether the *property* should ever be displayed. If you make a *property* invisible, it will always be hidden. |
| Editable | Specifies whether this *property* can ever be modified. Some static *properties* are special and cannot be changed, but you may sometimes have dynamic *properties* that are calculated from some other source and inserted into the database. You can mark such *properties* as not being editable to protect them from accidental change. |
| Persistent | Indicates whether the *property* is stored in the database. Dynamic and indirect *properties* should always be persistent. |
| Null Allowed | Specifies whether null is an allowed value for the property. See below 184 for a discussion about **Null Allowed** and **Required**. |
| Required | Specifies whether it is mandatory to provide a value for the property. See below 184 for a discussion about **Required** and **Null Allowed**. |
| Visible In Biskit Detail | Specifies whether this *property* should be visible when the full detail of a *Biskit* is displayed. |
| Visible in Biskit List | Specifies whether this *property* should be visible when a list of *Biskits* is displayed. |
| Visible in Collection Editor | Specifies whether this *property* should be visible when displaying a collection of *Biskits* of this type. Normally, when editing a collection of *Biskits*, the number of *properties* displayed would be kept very small. |

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## Required Fields And Null Allowed

**Required** and **Null Allowed** sound like they are exact opposites, and therefore **Exprodo DB** shouldn't support both of them. However, there is a subtle difference that means that it is sometimes useful to define a *property* that is both required and allows null. The **Null Allowed** attribute is checked when building an editor for a *property*. So, when displaying a drop-down for a *Mapped Integer*, *Mapped String*[251], **Java Enum** or **String Enum**, a value representing **null** will be added if the **Null Allowed** attribute is set to **true**.

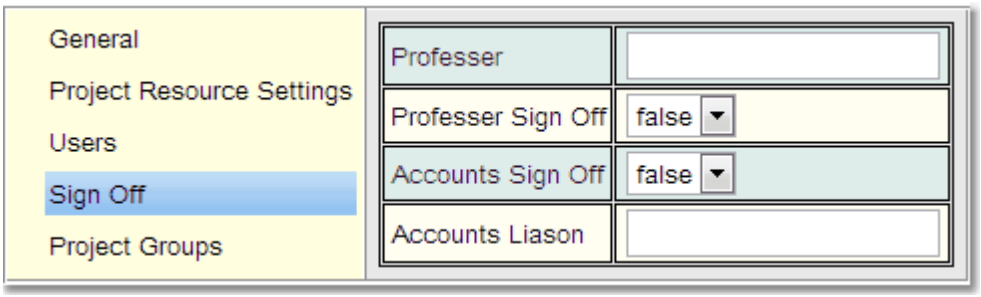
When a new *Biskit* is being created, the default value of a *property* displayed with a drop-down with **Null Allowed** set to **true** will be **null**, since that is the first value shown in the drop-down.

However, if a property is set to **Required**, then a value must be provided; it cannot be saved without a non-null value. For properties that have **Required** and **Null Allowed** both set to **true**, this means that the user is forced to choose one of the values from the drop-down as the default value of null cannot be left as the current value. A drop-down for a *property* that is **Required** but for which **Null Allowed** is **false** would be built without a value representing **null**, and so the user would not be forced to choose. Instead, the first value in the drop-down would be automatically selected unless a choice is made by the user.

For string properties, an empty string is a non-null value and so will satisfy **Required**. In order to make sure the user can not do this set a minimum length for strings where you want to make sure they enter something.

## Large Numbers Of Properties And Tab Layout

If you are adding a large number of *properties* to a *Biskit* and wish them to be displayed in particular groups under specific tab names then use the **Group** *meta-property*. All *properties* with the same **Group** *meta-property* will be displayed under the same tab which will be labelled with the value of the **Group** *meta-property* unless a layout has been defined for this *Biskit* in the **Layout Editor**. (The **Project** *Biskit* will always use **Group** for its layout)

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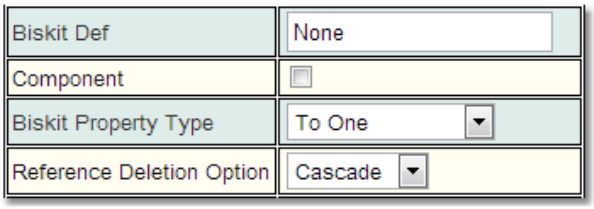
#### 4.9.3.1 Biskit Property Definitions

A *property*[252] of type *Biskit*[250] must specify the following information:




| Name | Meaning |
|---|---|
| BiskitDef | Specifies the type of *Biskit* this *property* will contain. |
| Component | Indicates whether the *Biskit* value is stored as a *reference*[252] to a *Biskit* stored somewhere else, or if its *properties* are stored directly as a component of its owning *Biskit*. Only used for static *properties*. |
| Biskit Property Type | **To One**, **Many To One**, **Master to Slave** or **Slave To Master** explained below[185]. |
| Inverse Property | Must be provided when this is a **Many To One** property, **Master to Slave** or **Slave to Master**, in which case this is the name of the *property* on the parent that points to the child *BiskitDef*[250]. |
| Reference Deletion Option | Whether this objects of this *Biskit* type can be deleted if *referenced* by other *Biskits* in the DB. **Cascade**, **No Action**, **Set null** |

### Biskit Property Type

| Value | Meaning |
|---|---|
| To One | The value of this *property* will *reference* a *Biskit*, but that *Biskit* will not know anything about us *referencing* them. |
| Many To One | The value of this *property* will *reference* a *Biskit* in a child-parent relationship. We are the child, and this *property references* the parent. The parent will also have a **Set** or **List** *property* that contains its child *Biskits* using a **One To Many** *property*.<br>With this value of **Biskit Property Type**, we must also specify the **Inverse Property** that is the name of the parent's *property* that contains the children. |
| Master to Slave | When a *Biskit* is required which has a large number of *properties*, ie. in excess of a thousand in SQL, the DB cannot cope with this.<br>In order to do this create **Slave** *Biskit's*, that is *Biskits* that are created, deleted and *referenced* with their **Master**. The **Master** *Biskit* would need a *property* of type *Biskit* which would point to each **Slave** and be a **Master to Slave** type, the **Slave** would need a *property* of type *Biskit* which would point to the **Master** and be a **Slave to Master** type. A **Master** can have many **Slaves** in order to reference as many *properties* as needed. The only caveat is that the **Primary Key Column Name** for any **Slave** *Biskit* must be different from the **Masters** (defaults to **id**, therefore needs to be changed), and different from any other **Slave** of that **Master**. The **Inverse Property** also needs to be set up in both *BiskitDefs*.<br>See Creating a Master-Slave Biskit Relationship[229] example. |
| Slave To Master | |

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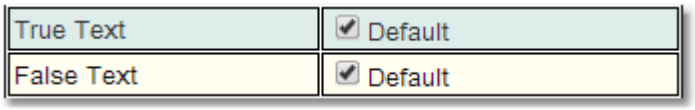
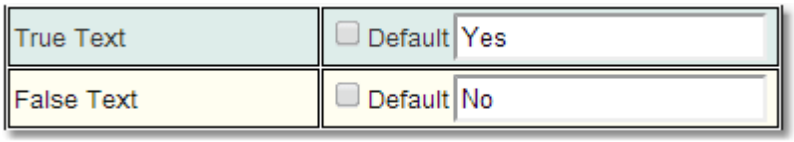
### 4.9.3.2 Boolean Property Definitions

A boolean *property*, as well as the normal settings required by a **PropertyDef**, may also specify the text to be displayed instead of **True** and **False**.




By un-ticking the **Default** option the user can then specify which text is to be used to display the value instead of **True**/**False**.

When used in a formula the values are **T** or **F.**

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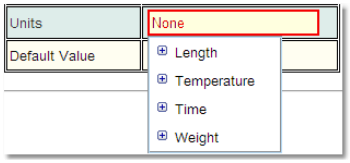
### 4.9.3.3 Double Property Definitions

A double *property*, as well as the normal settings required by a **PropertyDef**, may also specify its **Units**. Doubles are numbers with a decimal point.




There are four types of units **Length**, **Temperature**, **Time**, **Weight**. Users can also add their own units into **Exprodo DB**, Each type of unit has a number of options, and these are:

Name: Length

**Units**

| Name | Short Name | Multiplier | Sub Units Per Unit | Offset | Sub Unit |
|---|---|---|---|---|---|
| Inches | in | 0.0254 | 10 | 0 | |
| Yards | yd | 0.9144 | 10 | 0 | |
| Miles | miles | 1609.344 | 10 | 0 | |
| Feet | ft | 0.3048 | 12 | 0 | Inches |
| Metres | m | 1 | 10 | 0 | |
| Millimetres | mm | 0.001 | 10 | 0 | |
| Centimetres | cm | 0.01 | 10 | 0 | |
| Feet (decimal) | ft | 0.3048 | 10 | 0 | |

Name: Temperature

**Units**

| Name | Short Name | Multiplier | Sub Units Per Unit | Offset | Sub Unit |
|---|---|---|---|---|---|
| Centigrade | C | 1 | 10 | 0 | |
| Kelvin | K | 1 | 10 | -273.15 | |
| Fahrenheit | F | 0.555555555555556 | 10 | -17.7777777777778 | |
| Celsius | C | 1 | 10 | 0 | |

Name: Time

**Units**

| Name | Short Name | Multiplier | Sub Units Per Unit | Offset | Sub Unit |
|---|---|---|---|---|---|
| Seconds | s | 1 | 10 | 0 | |
| Minutes | mins | 60 | 10 | 0 | |
| Hours | hours | 3600 | 10 | 0 | |
| Days | days | 86400 | 10 | 0 | |
| Micro Seconds | us | 0.000001 | 10 | 0 | |
| Milli Seconds | ms | 0.001 | 10 | 0 | |
| Weeks | weeks | 604800 | 10 | 0 | |
| Months | months | 2629800 | 10 | 0 | |
| Years | years | 31557600 | 10 | 0 | |

Name: Weight

**Units**

| Name | Short Name | Multiplier | Sub Units Per Unit | Offset | Sub Unit |
|---|---|---|---|---|---|
| Stones | st | 6.35029318 | 14 | 0 | Pounds |
| Kilograms | kg | 1 | 10 | 0 | |
| Grams | g | 0.001 | 10 | 0 | |
| Ounces | oz | 0.028349523125 | 10 | 0 | |
| Pounds | lb | 0.45359237 | 10 | 0 | |
| Stones (decimal) | st | 6.35029318 | 10 | 0 | |

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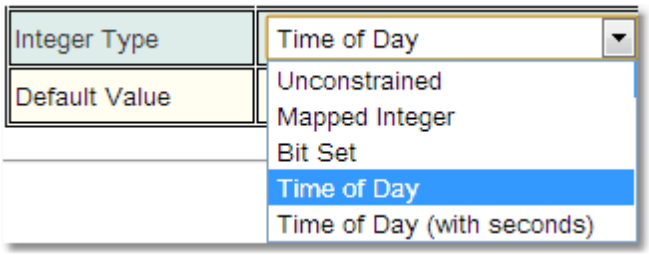
#### 4.9.3.4 Int Property Definitions

An integer (a whole number, no decimal information) *property*, as well as the normal settings required by a **PropertyDef**, must also specify its **Integer Type**. This indicates whether the content of the integer value should be constrained. The values allowed are:

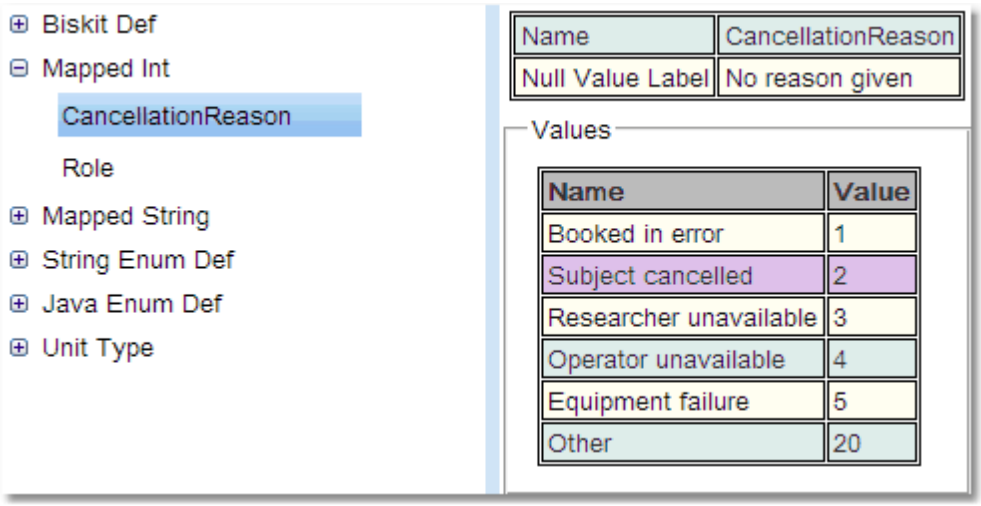



| Value | Meaning |
|---|---|
| Unconstrained | The value can be anything. |
| Mapped Integer | The value will be one of the values specified by a Mapped Integer[188]. The particular *Mapped Integer*[251] that constrains the value must be specified. |
| Bit Set | The value will be a Bit Set[190] containing values specified by a Mapped Integer[188]. The particular *Mapped Integer* that constrains the value must be specified. |
| Time of Day | Stored in the database as the number of seconds since midnight. The only difference is the formatting on output, with or without seconds. |
| Time of Day (with seconds) | |

##### 4.9.3.4.1 Mapped Integers

A *Mapped Integer*[251] is a mapping between a text display value and an integer value. It provides a way for a user to edit an integer *property* by seeing a drop-down list of text values, hiding the numerical values from them. This provides a means of generating drop-down boxes for entering values where there is a fixed set of valid values that can be entered, while storing an integer in the database.

Here is an example of a *Mapped Integer* defined in the database:

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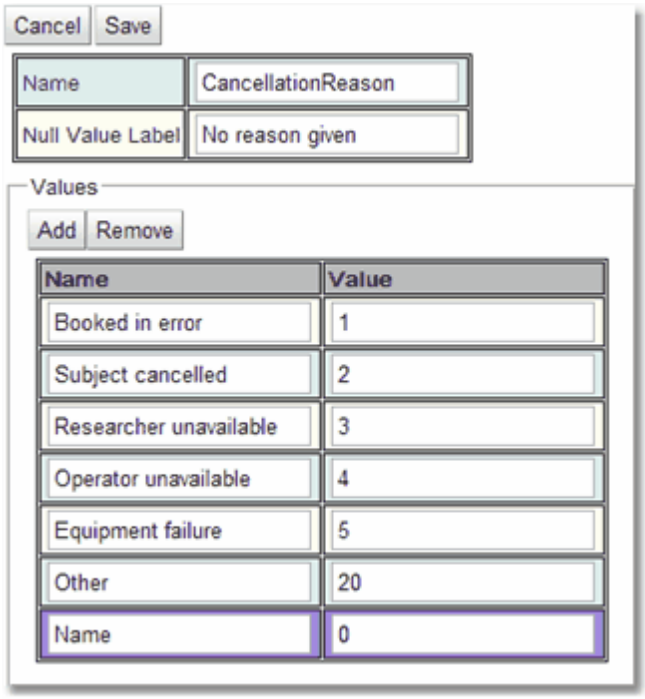
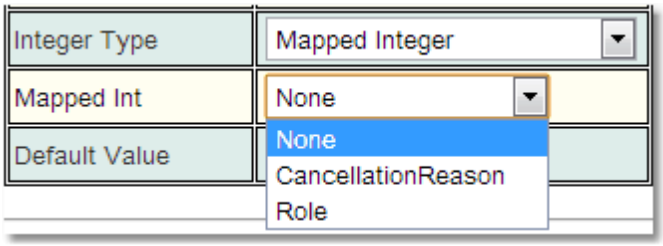
To add new values press the **Edit** button and then the **Add** button, the new entry will appear at the bottom, set the text string to be viewed and the number to store it as. Then press **Save**.




There can be as many *Mapped Integers* as needed in the database. Once the *Mapped Integer* is created, to use it, create an integer *property* on a *BiskitDef*[250] and set its **Integer Type** to be *Mapped Integer* and chose the *Mapped Integer* you have created.




The database stores the values as integers. The definition of the *Mapped Integer* in the *Bakery*[250] just maps those numbers to a string for display. At a later date new items can be added to the mapping (new strings and new integers), the mapping can be changed by changing the text associated with a particular integer, then everything in the database that has that integer value will be displayed with the new string.

If there is a mapping where 1 displays as "A", and 2 displays as "B", and then this mapping is changed so that 2 displays as B and 3 displays as A, and there is no mapping for 1, then there won't be a way to display a text value for 1, and there won't be a way to search for it.

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#### 4.9.3.4.1.1 Bit Sets

A *Bit Set*[250] is a *BiskitDef*[250] integer property that uses a special sort of *Mapped Integer*[251]. To be used as a *Bit Set*, a *Mapped Integer* must map integer values that are between 0 and 31. It doesn't need to map all 32 possible values, but the values mapped must be within that range.

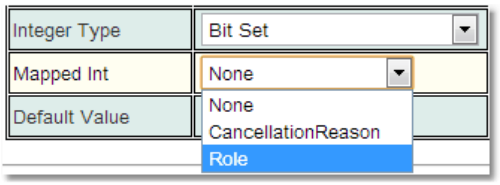
A *Bit Set* works by using binary values. Each *Bit Set* has a particular value, and when a number of bits have been set the value of the integer is the total of each of the individual bits values added up.

| Bit | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | ..... |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Value | 1 | 2 | 4 | 8 | 16 | 32 | 64 | 128 | 256 | 512 | 1024 | 2048 | 4096 | 8192 | 16384 | 32768 | ..... |

Therefore if bits 1, 5 and 7 are set, the value is 162. (2+32+128)

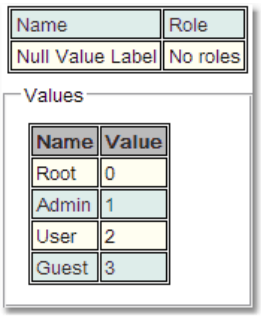
*Bit Sets* allow the user to combine up to 32 options in any combination required. In **Exprodo DB** we have one default bit set and that is for User Roles[190].

There can be as many *Bit Sets* as needed in the database. Once the *Bit Set* is created as a *Mapped Integer*, to use it, create an integer *property*[252] on a *BiskitDef* and set its **Integer Type** to be *Bit Set* and chose the *Mapped Integer* that has been created.




#### 4.9.3.4.1.2 User Roles

There is a special *Mapped Integer*[251] definition called *Role*[253]. This is used by the *Roles* bit set property of a **User**. Since it is used as a *Bit Set*, it may only have values of 0 to 31. Value zero is special in this *Mapped Integer*. Any user whose roles *property*[252] has bit 0 set is a **Root** user and Permissions[97] do not apply to such a user.




So using the Bit Set[190] bit table a user that has both **Admin** and **User** roles would have a value of 6, the 1 and 2 bits set. A **Guest** user would have the value 8, just the 3 bit set.

The user may add additional values to this *Mapped Integer*, and may rename any of them (including **Root**)

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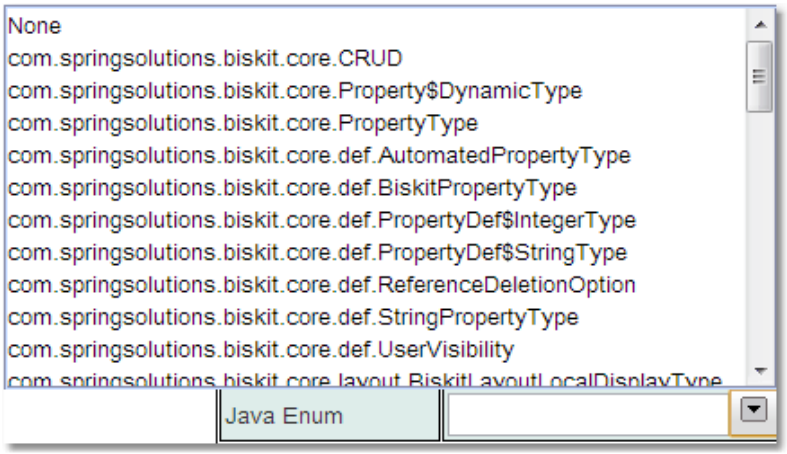
#### 4.9.3.5 Java Enum Property Definitions

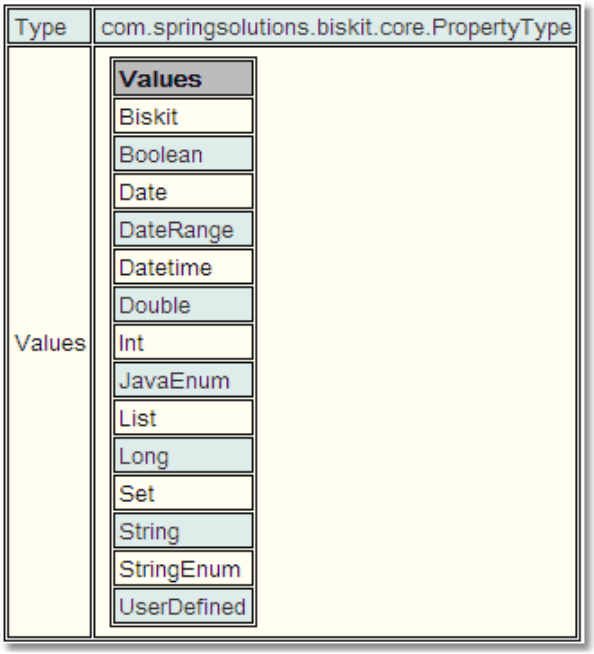
A **Java Enum** *property*[252], as well as the normal settings required by a **PropertyDef**, must also specify its **Java Enum**. This indicates which of the **Java Enums** to be used.




##### 4.9.3.5.1 Java Enum Definitions

A **Java Enum** is a representation of an enumeration defined in the original Java source code. End users should not create, change or delete any **Java Enum** defined in **Exprodo DB**. You may create *properties*[252] of type **Java Enum** and use any of the existing enumerations, but you should do so carefully in case the enumeration changes or is deleted in a future release.

*Properties* of type **Java Enum** are edited with a drop-down list box showing the values from the enumeration. In special cases, such a drop-down list box might display only some of the values from the enumeration. However, it is not possible for a user-defined *property* to behave in this manner.

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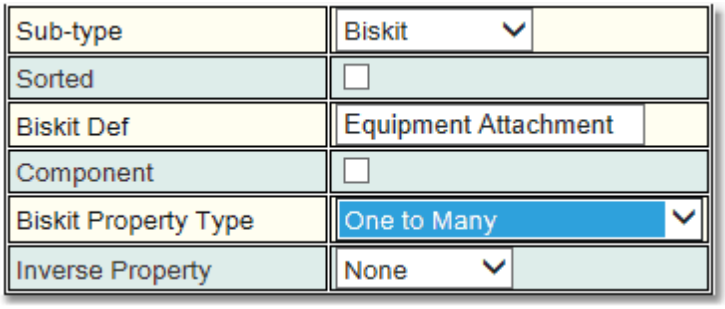
### 4.9.3.6 Set Property Definitions

A *property*[252] of type **Set** must specify the *Property Type*[252] of the elements within the **Set**. If the elements are not *Biskits*[250], then there are no further settings required. If the elements are *Biskits*, then the following must be specified:




| Name | Meaning |
|---|---|
| Sub-type | The type of data stored by the *property* represented by this definition. For types other than **Biskit** the only additional *meta property*[251] will be **Sorted**. |
| Sorted | Indicates whether the contents of the **Set** are sorted or not. |
| BiskitDef | Specifies the type of *Biskit* the set will contain. |
| Component | Indicates whether the *Biskit* value is stored as a *reference*[252] to a *Biskit* stored somewhere else, or if its *properties* are stored directly as a component of its owning *Biskit*. Normally only used for static *properties*. |
| Biskit Property Type[193] | **One to Many**, **Many to Many Persisted**, **Many To Many Unpersisted**, **To Many**, explained below[193]. |
| Inverse Property | This is the property on the **Set** *Biskit* which will point back to the parent *Biskit* |

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## Biskit Property Type

| Value | Meaning |
|---|---|
| One To Many | Indicates the set contains "child" *Biskits* that will all *reference* this *Biskit* as the "parent" in a **Many To One** *Biskit property*.<br><br>With this value of *Biskit Property Type*, we must also specify the **Inverse Property Name** that is the name of the child's *property* that *reference* the parent. |
| Many To Many Persisted | This **Set** represents the persisted half of a **Many To Many** *property*. See Many To Many Properties 192. |
| Many To Many Unpersisted | This **Set** represents the unpersisted half of a **Many To Many** *property*. See Many To Many Properties 192. |
| To Many | This **Set** is a collection of *Biskits*, but the *Biskits* we contain do not *reference* us in any way. |

Currently **Many to Many** (in all its forms) is not implemented for dynamic **Set** *properties*.

## Many To Many Properties

Suppose a user can be associated with any number of *projects* 251, and a *project* can have any number of users associated with it. This means there will be a collection of *projects* stored in a *property* on each user, and also a collection of users stored in a *property* on each *project*. Both sides of this relationship are known as **Many To Many** properties.

If a *project* is a member of a user's *projects*, then that same user would be a member of that same *project's* users and vice versa. This means it is not necessary to save both sides of this relationship to the database because of this symmetry. However, there are some occasions when it is necessary to know which side is persisted, and so one half is known as a **Many To Many Persisted**, and the other half is known as **Many To Many Unpersisted**.

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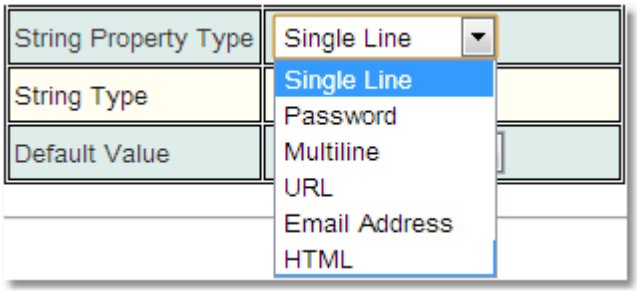
### 4.9.3.7 String Property Definitions

*Property*[252] definitions of type **String** must specify the following information:




| Name | Meaning |
|---|---|
| String Property Type[194] | Defines the nature of the content of the string. |
| String Type[195] | Indicates whether the content of the text value should be constrained. |

## String Property Type

This defines the nature of the content of the string, with possible values shown in this table:

| Value | Meaning |
|---|---|
| Single Line | One line of text. |
| Password | A single line content that should be hidden when typed. Intended for passwords, but can be used for any text that should not be seen as it is typed. |
| Multiline | A text area with multiple lines. Typically, the **PropertyDef** would also specify the number of rows to display. |
| URL | A single line of text that is expected to contain the web address of some page. When rendered in a read-only format, it displays with an HTML anchor element so that it will operate as a hyperlink.<br><br>The content can contain a prefix of the form "http://" or "https://" or any other valid protocol recognised by all web browsers, but the protocol prefix is not required. |
| Email Address | A single line of text that is expected to contain an email address. When rendered in a read-only context, this is displayed with a "mailto:" HTML link so that it will automatically create an email when clicked. |
| HTML | A text area that contains HTML. When edited, this *property* will use an HTML editor, with tools for helping you to create valid HTML.<br><br> |
| Colour | Three hexadecimal numbers that define the RGB colour to be displayed. |

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## String Type

This indicates whether the content of the text value should be constrained. The values allowed are:

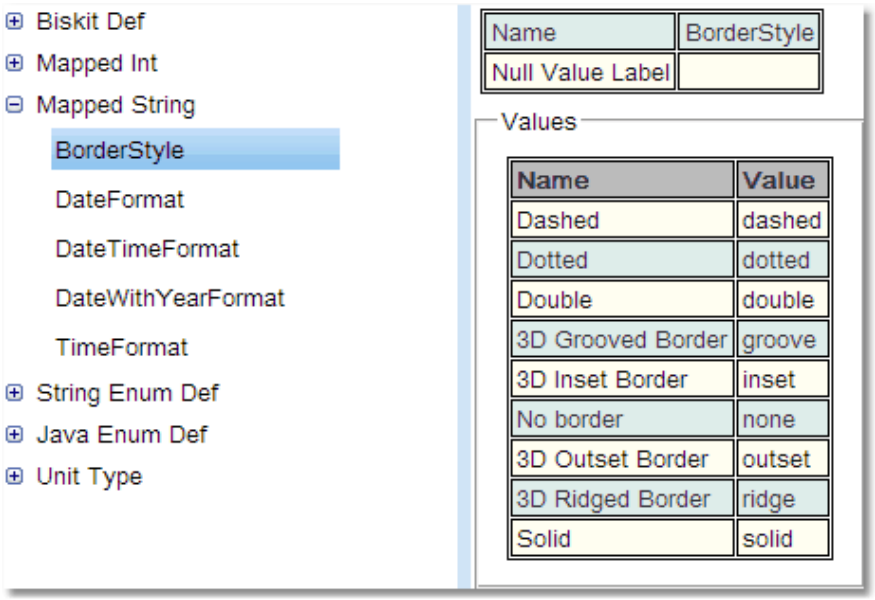
| Value | Meaning |
|---|---|
| Unconstrained | The text value can be anything. |
| Mapped String | The value will be one of the values specified by a Mapped String[195]. The particular *Mapped String*[251] that constrains the value must be specified. |
| Biskit Type | The value will be the type of a *BiskitDef*[250], and so will be configured as a drop-down listing all the known *Biskit Types.*[250] |

#### 4.9.3.7.1 Mapped Strings

A *Mapped String*[251] is similar in concept to a *Mapped Integer*[251], but instead of storing an integer in the database, a text value is stored instead. This means that a *Mapped String* is a mapping from one set of strings to another set of strings. When a **String** *property*[252] is created on a *BiskitDef*[250], you can indicate that it should be constrained to contain values from a *Mapped String*. Then, when a user edits such a *property*, they will see a drop-down that lists the labels defined in the *Mapped String*, although the value stored in the database will be the associated text value.

*Mapped Strings* are similar to String Enumerations[197], in that they both store values as text, and they both generate a drop-down selection list. *Mapped Strings* are the preferred mechanism though, because by decoupling the displayed labels from the values stored in the database, it makes things very easy it you ever want to change the way values are displayed to users. This is why **String Enumerations** are deprecated, and may be removed in a future version of **Exprodo DB**.

Here is an example of a *Mapped String* defined in the database:

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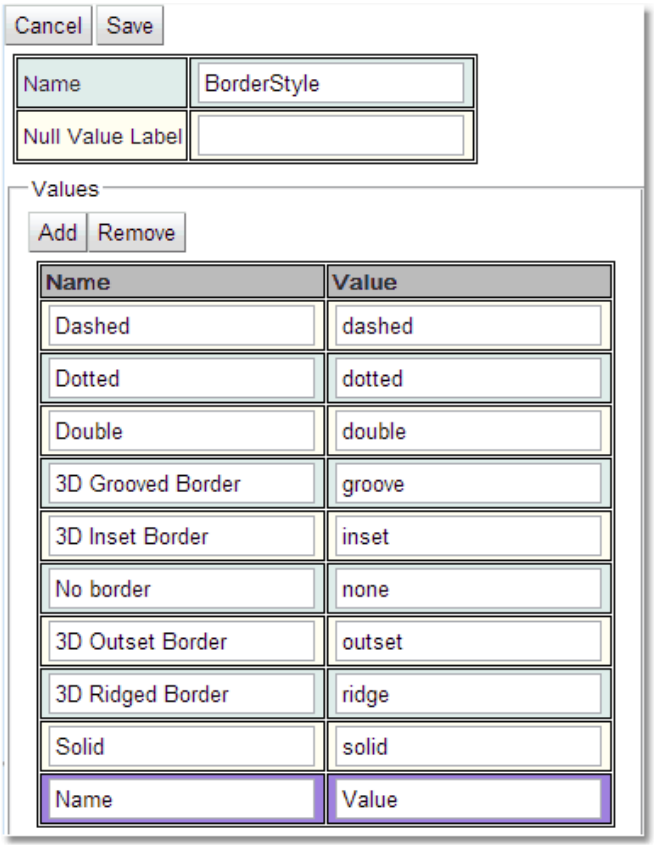
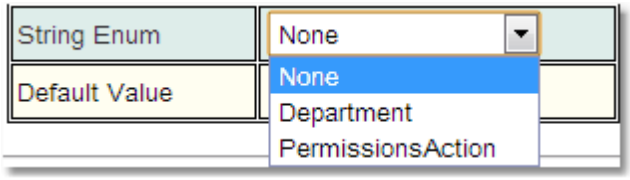
To add new values press the **Edit** button and then the **Add** button, the new entry will appear at the bottom, set the name of enumeration and the value to store with that name. Then press **Save**.




#### 4.9.3.8 String Enum Property Definitions

A **String Enum** property, as well as the normal settings required by a **PropertyDef**, must also specify its **String Enum**. This indicates which of the **String Enums** to be used.

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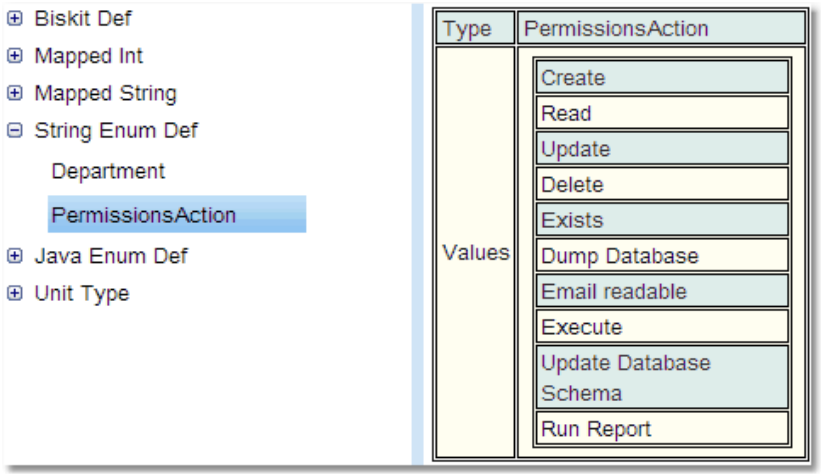
#### 4.9.3.8.1 String Enumerations

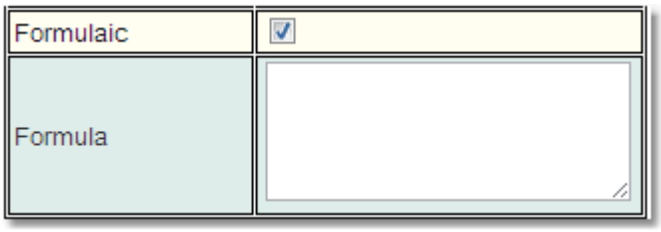
A **String Enumeration** is like a Mapped String[195] in which the name and value are always the same. A *property*[252] with a type of **StringEnum** will be editable with a drop-down list box showing all the values in the enumeration.

**String Enumerations** are deprecated and *Mapped Strings* should be used instead. In some future release, **String Enumerations** may be removed. This is because, by tightly coupling the displayed text with the text stored in the database, it makes it very difficult to change the text that is displayed.




### 4.9.4 Formulae

If the **Formulaic** check box is ticked then the value of this *property*[252] will be calculated by a formulae.




The syntax for the formulae is based on MySQL, with one major exception, MySQL uses the column name in its formulae, most users of **Exprodo DB** would prefer to use the *property* name. In order to do this there is a special syntax, if the *property* name is in [ ], such as [durationInMinutes] then **Exprodo DB** will convert the *property* name to the correct column name.This also allows the user to specify **[biskit.property]** in order to access *properties* of related *Biskits*[250].

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When creating formulae use all the standard number calculations * / + - , as well as setting up logic to determine the correct answer.

For instance there are two main logical options **if** and **case**:

| Logic | Description |
|---|---|
| if (expr1, expr2, expr3) | If expr1 is true then expr2 will be returned otherwise expr3 is returned. (You cannot use the if statement) |
| case<br>when expr1 then option1<br>when expr2 then option2<br>else option3<br>end | If expr1 is true do option1, otherwise if expr2 is true do option2, otherwise do option3. Case statements can be nested one inside the other. |

An expression can include < > != = () as well as AND or OR for example:

**[costPerHour]** > 1000 OR (**[costPerHour]** < 500 AND **[costPerHour]** > 275)

When dealing with strings there are a number of functions that can be used, here is a subset of the more useful ones:

| Function | Description |
|---|---|
| length(str) | Return the length of the string |
| concat(str1,str2) | Return str 1 and str2 concatenated together |
| replace(str1,str2,str3) | In str1, find where str2 occurs, and replace it with str3 |
| substr(str,pos) | Return the string that starts at the pos character of str. |

When dealing with dates there are also many functions some of the more useful are:

| Function | Description |
|---|---|
| datediff(date1, date2) | Returns the difference in whole days between two dates. |
| unix_timestamp(date) | Returns the number of seconds since midnight 1/1/70. |
| timediff(date1, date2) | Returns the difference between two times as a time string, |
| time_to_sec(time) | Returns the conversion of a time string to seconds, |

Using **time_to_sec()** in conjunction with **timediff()** allows a calculation of the time in seconds between two times. i.e. **time_to_sec(timediff(date1,date2))**

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Here is an example of a formulae using a nested case and **datediff()**.

In this example the value of a cost *property* of a *booking*[250] is determined depending on the status of a *booking*.
If the *booking* is denied, or cancelled with more than seven days to go then do not charge. If the *booking* goes ahead then charge the rate found in the *property* **costPerHour** in the *Project Resource Settings*[251] for that *project*[251] multiplying by the duration in minutes of the booking divided by 60 to give hours. If the *booking* was cancelled less than two days ago charge 50% otherwise charge 20%.

```
case
  when [status] = 'Denied' then 0
  when [status] = 'Approved' or [status] = 'Requested' then
[projectResourceSettings.costPerHour] * [durationInMinutes] / 60
  else
    case
      when datediff(start_date, [cancelled]) >= 7 then 0
      when datediff(start_date, [cancelled]) >= 2 then
0.2*[projectResourceSettings.costPerHour]  * [durationInMinutes] / 60
      else 0.5*[projectResourceSettings.costPerHour]  * [durationInMinutes] / 60
    end
end
```

## Known Formulae Problems

There are a number of issues with using formulae in *Biskits*. As the formulae has to be converted from what is written in **Exprodo DB** to MySql there are currently some functions that will not work.

1. Any function that requires a string constant as a parameter. These constants do not currently convert from **Exprodo DB** to MySQL cleanly.
   For example: **timestampdiff**(unit,datetime_expr1,datetime_expr2) where **unit** is one of FRAC_SECOND (microseconds), SECOND, MINUTE, HOUR, DAY, WEEK, MONTH, QUARTER, or YEAR. **Unit** does not convert properly.

2. The **if** statement does not work so use the **if()** function instead.

3. Use **'T'** and **'F'** for the value of Boolean properties.

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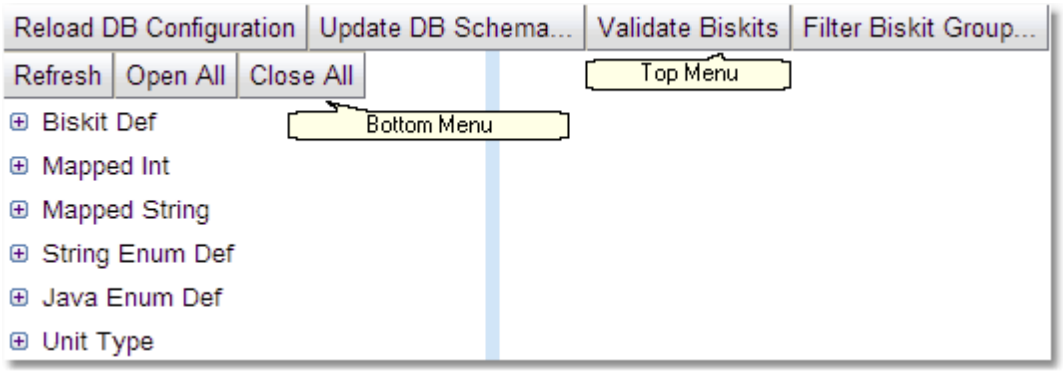
### 4.9.5 Bakery Editior

The **Bakery Editor** allows an **Admin** user to see, modify, create and delete *Biskits* 250 and their *properties* 252. The **Bakery Editor** also allows access to any *Mapped Integers* 251 or *Strings* 251, any **String** and **Java Enumeration** definitions as well as the unit definitions. To access the **Bakery Editor** page it can be found at **Admin->Bakery**. However, the administrator may have configured **Exprodo DB** so that the menu is different.

When entering the **Bakery Editor**, in the left hand pane will be all the current definitions for *Biskits* and the additional definitions in an expanding tree structure. The right hand pane will hold the information for whatever is selected in the left hand pane.




The top menu provides buttons to check and update the database once the user has completed any changes in the DB.

| Top Menu Item | Description |
|---|---|
| Reload DB Configuration | Tells the server to reconfigure according to the current dynamic *property* definitions you have. Make sure the database schema is up-to-date before running this. |
| Update DB Schema | Asks the server to generate a SQL script that can be used to create whatever columns are required for the dynamic *property* definitions. After the script has been generated, the user will have the option of applying it. |
| Validate Biskits | Checks that *Biskit* definitions are self consistent |
| Filter Biskit Group | Display only those *Biskits* in a particular group. By default no groups are set up, if your own *Biskets* are created they should be put into their own group in order to use this filter to find them quickly. |

When changes have been made to the DB via the **Bakery Editor** the user MUST make sure to update the DB properly by using these buttons in the correct order:

1. Press **Update DB Schema** to generate a script to update the SQL database. Then apply the script to make the changes

2. .Press **Validate Biskit** to make sure any *Biskits* that have been changed have a self consistent definition.

3. Press **Reload DB Configuration** to reconfigure the server so that it is using the new DB schema.

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Once this is done the **Exprodo DB** will now be able to use the changes implemented in the DB through the **Bakery Editor**.

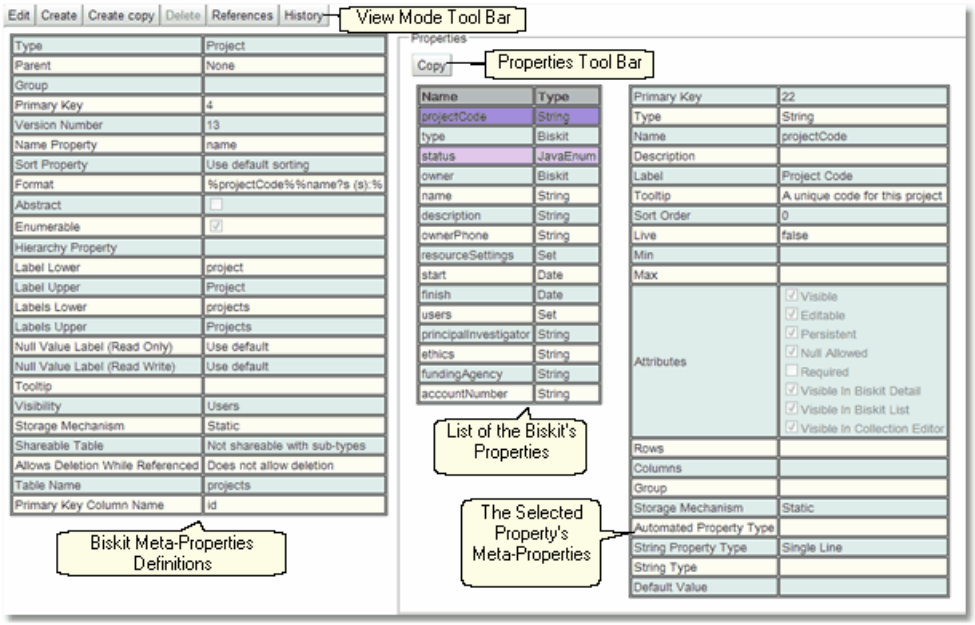
The bottom menu provides buttons to deal with the expanding tree structure.

For a complete description of the standard toolbar buttons read the Toolbar Button Standard Definition 15 chapter.

Use these in conjunction with the **Filter Bisket Group** button on the top menu to aid the viewing of the tree information.

## View Mode

View mode allows the user to see each of the *Biskits* and their *properties*. You can also copy *properties* for later use in a different *Biskit*.




For a complete description of the standard toolbar buttons read the Toolbar Button Standard Definition 15 chapter.

Items that are created will not exist in the database until you press the **Save** button and then follow the procedure to validate, update and reload the DB 200.

| Properties Tool Bar | Description |
|---|---|
| Copy | This button will take a copy of the selected *properties* and place them in a buffer to allow pasting into another *Biskit*. Multiple *properties* may be selected by using **ctrl** and **shift**. |

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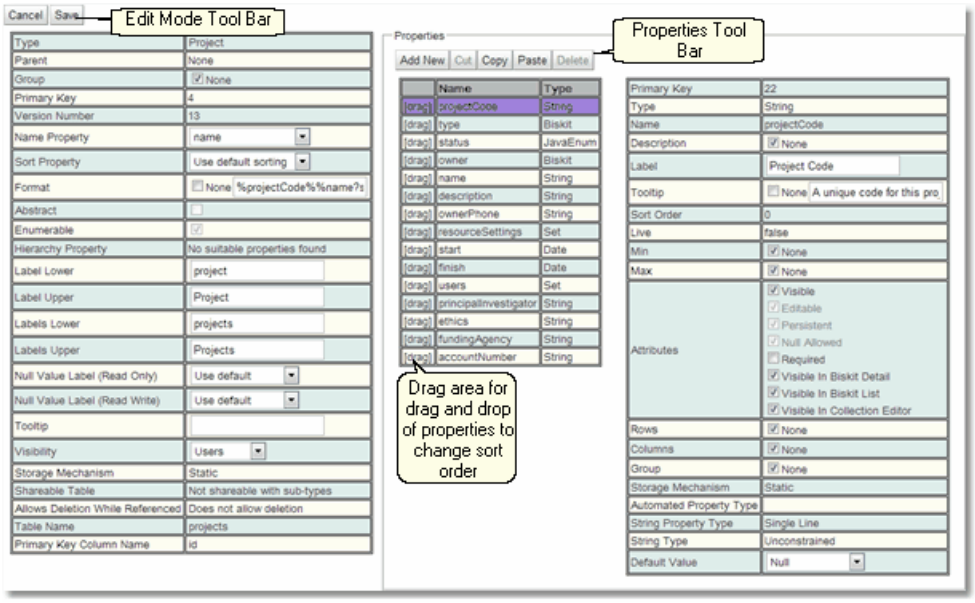
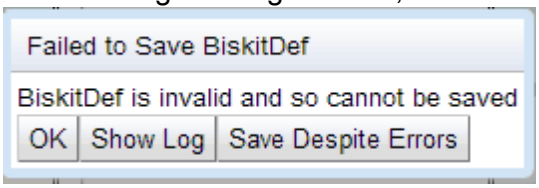
## Edit Mode

Edit mode allows the user to edit a *Biskit* and all its *properties*. Once changes are saved, the DB will need to be validated, updated and reloaded [200], in order for them to be permanent.




For a complete description of the standard toolbar buttons read the Toolbar Button Standard Definition [15] chapter.

| Edit Mode Tool Bar | Description |
|---|---|
| Save | Saves all the changes to the *Biskit* and its *properties*. In order to make these changes permanent follow the procedure to validate, update and reload the DB [200].<br>When saving a changed *Biskit*, an error message may occur:<br>  <br><br>Look at the log (**Show Log** button) and then depending on the errors decide whether to **Save Despite Errors**. Sometimes *Biskits* need to be saved with errors due to the need to set up links between *Biskits*, and both *Biskits* need to be created before that can be done.<br>With some errors there is not the choice of whether to **Save Despite Errors**, these errors must be fixed before saving because they can corrupt the database. |

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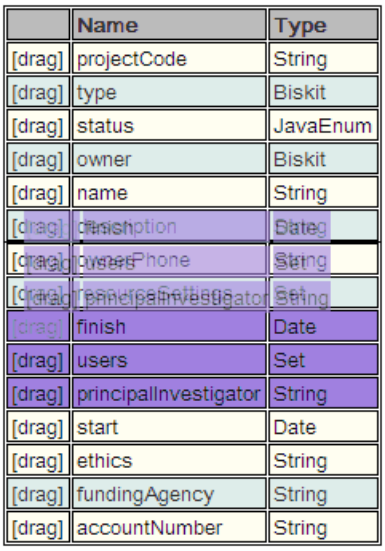
| Properties Tool Bar | Description |
|---|---|
| Add New | Adds a new *property* to the *property* list. The *property* is automatically selected and available for its *meta properties* 251 to be modified. |
| Cut | Multiple *properties* may be selected by using **ctrl** and **shift** |
| Copy | Multiple *properties* may be selected by using **ctrl** and **shift**. |
| Paste | Pastes the *properties* held in the buffer into the current *property* list. |
| Delete | Multiple *properties* may be selected by using **ctrl** and **shift**. |



| | Name | Type |
|---|---|---|
| [drag] | projectCode | String |
| [drag] | type | Biskit |
| [drag] | status | JavaEnum |
| [drag] | owner | Biskit |
| [drag] | name | String |
| [drag] | finish | Date |
| [drag] | users | Set |
| [drag] | principalInvestigator | String |
| [drag] | finish | Date |
| [drag] | users | Set |
| [drag] | principalInvestigator | String |
| [drag] | start | Date |
| [drag] | ethics | String |
| [drag] | fundingAgency | String |
| [drag] | accountNumber | String |

*Properties* are placed in the list of *properties* for a *Biskit* as defined by their **Sort Order** *meta-property*.

That **Sort Order** *meta-property* cannot be edited directly but changed by using the [drag] area, and dragging and dropping selected properties within the property list.

In the example three *properties* have been selected using the **shift** key and are being dragged up the list to be placed higher up.

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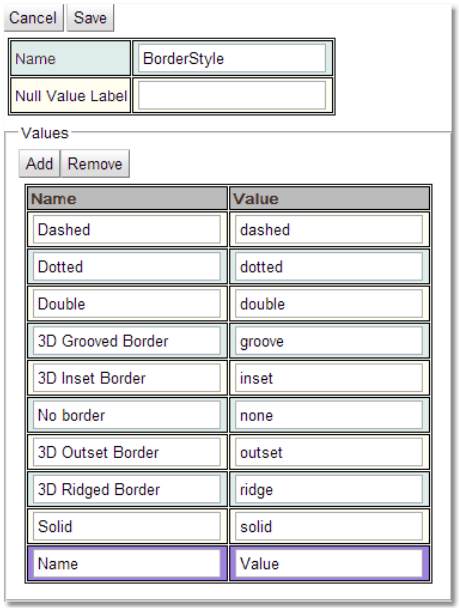
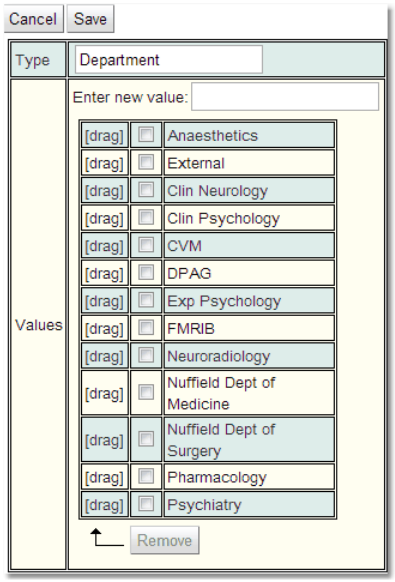
## Editing Mapped Int and Mapped String

When in edit mode for *Mapped Int* and *Mapped String* there are buttons to **Add** and **Remove** items. When an item is added, a new **Name Value** pair appear at the bottom of the list to put in the new mapping. To remove items select a **Name Value** pair first then press the **Remove** button.




## Editing String Enum Def

When in edit mode for **String Enum Def** to add a new value, use the **Enter New Value** box and press **Enter** when finished. The new value is added to the bottom of the list. To remove items select the check box for the items to be removed and then press the **Remove** button. To move an item to a different position in the list use the [drag] column. Select the item to be dragged and then drag and drop it where required.

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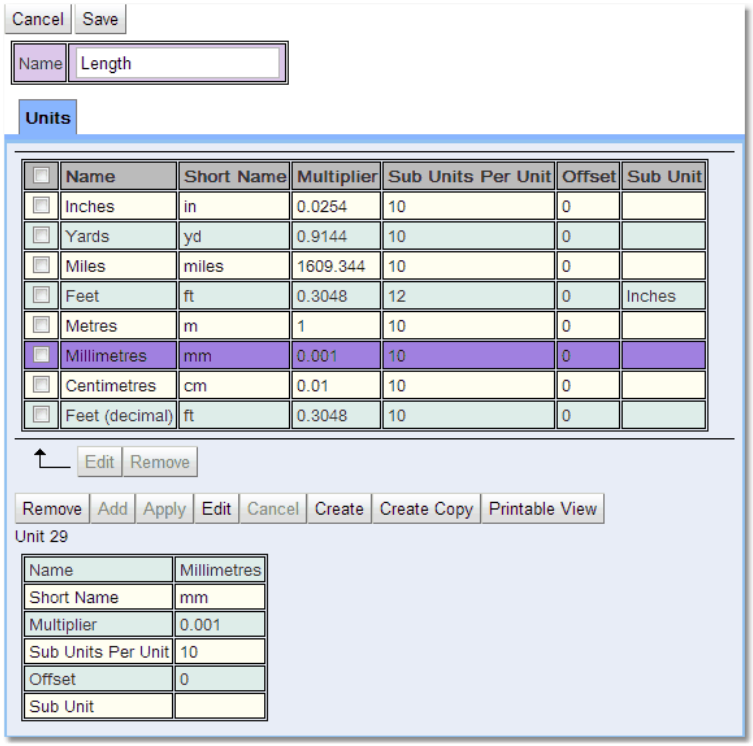
## Editing Units

When in edit mode there is a list view, once a unit is selected there will be a single record view underneath the list view. For more information on How to Edit Multiple Items At Once [47] in the list view and How to Edit A Single Item [49] in the record view, read the appropriate sections of the Data Explorer [46] chapter

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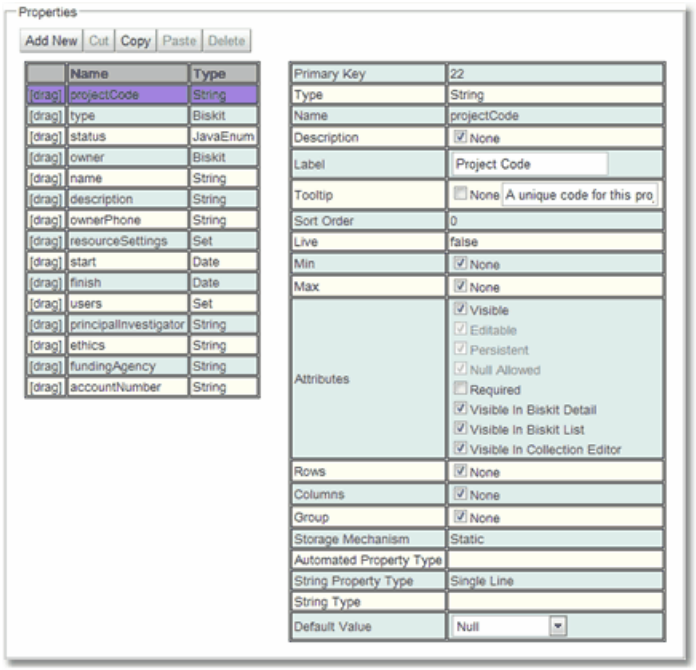
### 4.9.5.1 Bakery Editor Examples

#### 4.9.5.1.1 Adding Properties

An example of adding a *property*[252] to the *Biskit*[250] of type **Project** called **ProfessorSignOff**, of type **boolean** which is required to always have a value and starts with the value **False**.

1. Go to **Admin->Bakery**,
2. Press the **Open All** button to open the **Biskit Tree**
3. Select the *Biskit* to add *properties* to (in this case **Project**)
4. Press the **Edit** button to get the *Biskit* into edit mode




5. Press the **Add New** button to add a new *property*.

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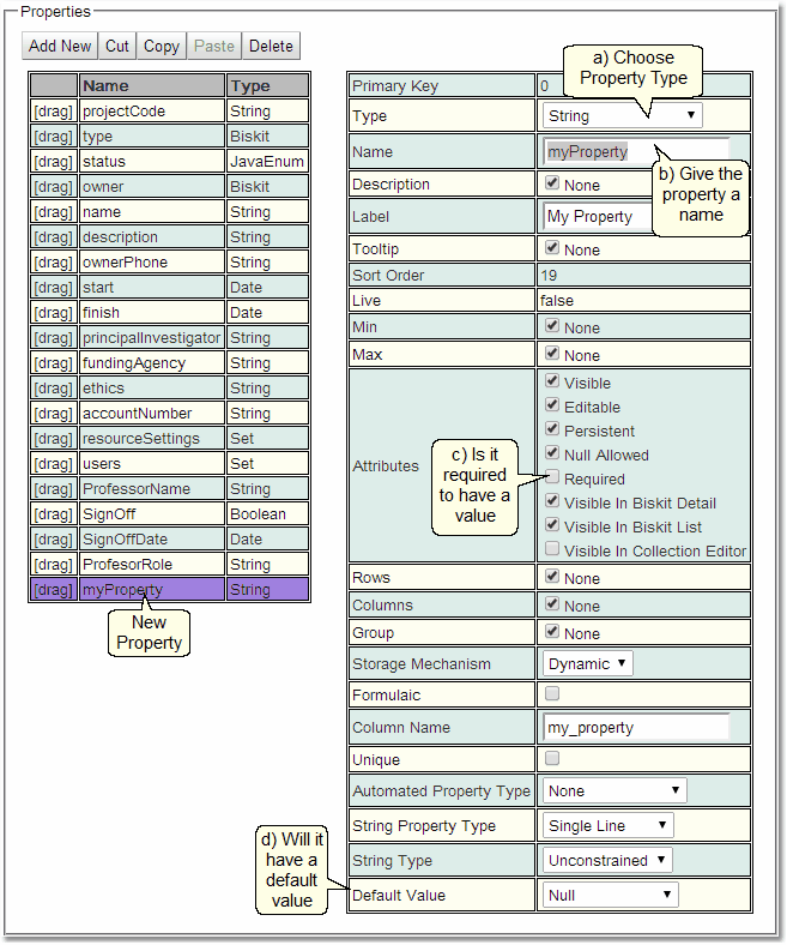


6. Update the *meta properties*[251] of the *property*. Most of them will not need to be changed but as a minimum
   a) Decide on the **Type** required.
   b) Give the *property* a name, this needs to be unique, **Exprodo DB** will update the **Label** and **Column Name** *meta properties* at the same time. Usually these can be left alone, but **Label** may need to be modified as this is what is displayed for this *property* in reports etc.
   c) When a *Biskit* of type **Project** is created by a user, is the user required to give this *property* a value. (**Null Allowed**, **Min** and **Max** also have an impact on data requirements and may be used instead of or in conjunction with **Required**.)
   d) Will the *property* have a default value when a *Biskit* of type **Project** is created.

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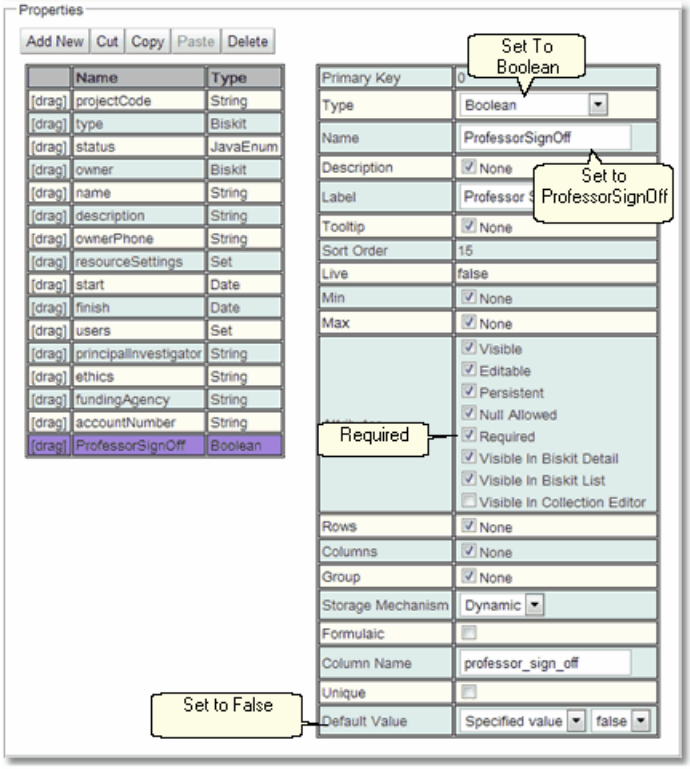
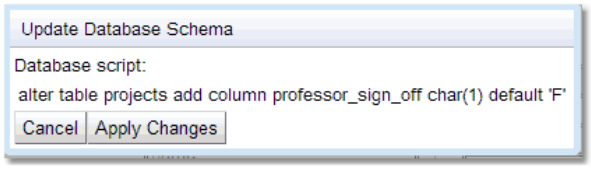


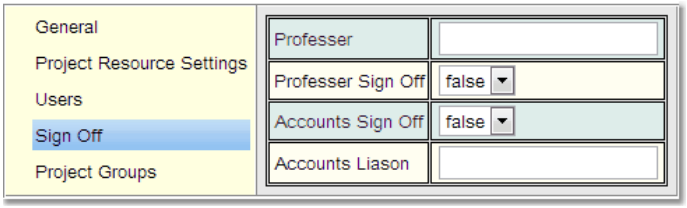

7. Press the **Save** button.
8. If there are no errors then update the database:
   a) Press **Update DB Schema** to implement changes in the DB, the following should pop up:




9. Press the **Apply Changes** button to update the database. There will be a response saying how many rows affected. Press **OK** to finish.

   a) Press **Validate Biskits** button to check the database *Biskits*.
   b) Press **Reload Database Configuration**, to load the new database into **Exprodo DB**
   c) Refresh the browser

Remember if adding a large number of *properties* to a *Biskit* and they need to be displayed in particular groups under specific tab names then use the **Group** *meta-property*. All *properties* with the same **Group** *meta-property* will be displayed under the same tab which will be labelled with the value of the **Group** *meta-property*, unless a layout has been defined for this *Biskit* in the **Layout Editor**. (The **Project** *Biskit* will always use **Group** for its layout).

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#### 4.9.5.1.2 Adding Formulaic Properties

An example of adding a formulaic *property*[252] to the *Biskit*[250] of type **Booking**, which will be called **BookingCost** and will calculate the cost of the *booking*[250] depending on the duration of the *booking* and whether it was cancelled or not.

If a *booking* was **Denied,** or **Cancelled** more than 7 days before it was due, then no cost. If it was **Cancelled** more than 2 but less than 7 days ago, then 20% of cost, if it was **Cancelled** with less than 2 days to go then 50% of the cost otherwise full cost.

The formula used will be:

```
case
  when [status] = 'DENIED' then 0
  when [status] = 'APPROVED' or [status] = 'REQUESTED' then
[projectResourceSettings.costPerHour] * [durationInMinutes]/60
  else
    case
      when datediff([dateRange.start], [cancelled]) >= 7 then 0
      when datediff([dateRange.start], [cancelled]) >= 2 then
0.2*[projectResourceSettings.costPerHour] * [durationInMinutes]/60
      else 0.5*[projectResourceSettings.costPerHour] * [durationInMinutes]/60
    end
end
```

[**status**] will refer to a *property* called **status** found on the **Booking** *Biskit*.

[**projectResourceSettings.costPerHour**] will refer to a *property* called **costPerHour** that is found on the *Biskit* that is *referenced*[252] by the **projectResourceSettings** *property* of the **Booking** *Biskit*. In this case the type of *Biskit referenced* is **Project Resource Settings.**

[**durationInMinutes**] will refer to a *property* called **durationInMinutes** found on the **Booking** *Biskit*.

[**dateRange.start**] will refer to a *property* called **dateRange** found on the **Booking** *Biskit*. **dateRange** is of type **DateRange**, this type has some sub types, one of which is **start**. **start** holds the date and time of the start of the date range.

[**cancelled**] will refer to a *property* called **cancelled** found on the **Booking** *Biskit*.

**datediff** is a MySQL function that returns the difference between two dates as a whole number of days. For more accurate time differences use a combination of **timediff()** and **time_to_sec()** ( i.e. **time_to_sec(timediff**(date1,date2)**)** returns the number of seconds between the two dates ).

We will be using the **costPerHour** *property* that can be set up for each *resource*[252] a *project*[251] can use. This way individual *projects* can be set up to pay different amounts for each *resource*.

1. Go to **Admin->Bakery**,
2. Press the **Open All** button to open the **Biskit Tree**
3. Select the *Biskit* to add *properties* to (in this case **Booking**)
4. Press the **Edit** button to get the *Bislkit* into edit mode

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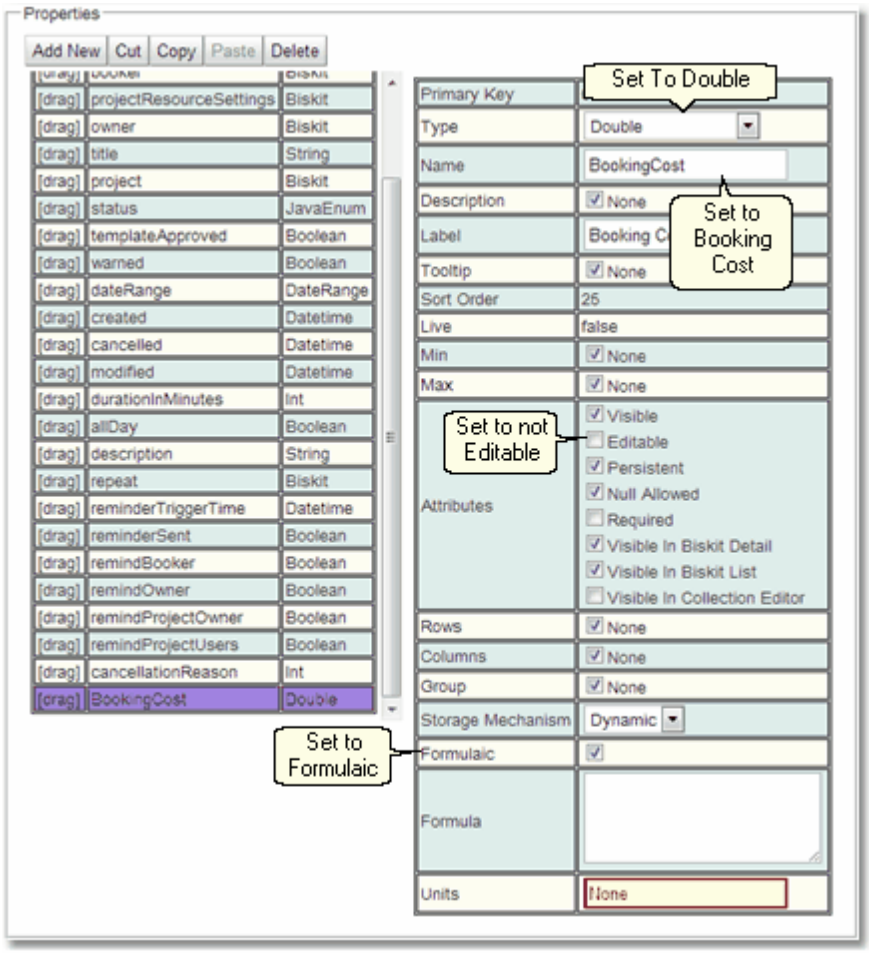
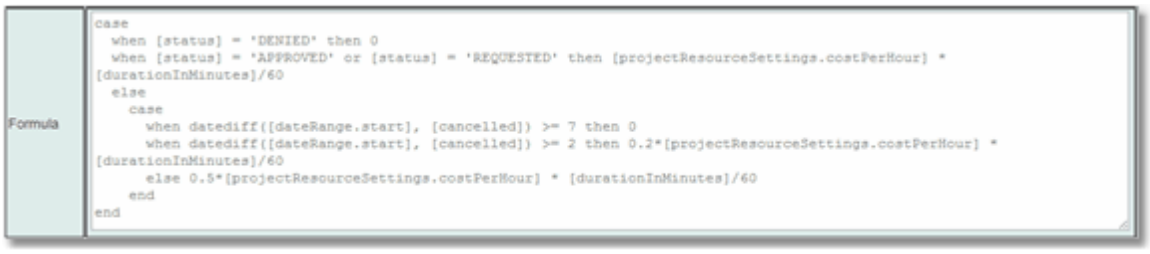
5. Press the **Add New** button to add a new *property*.
6. Update the *meta properties* of the *property*. Most of them do not need to be changed but as a minimum
   a) Change **Type** to double.
   b) Change **Name** to **BookingCost**.
   c) Make it not **Editable**.
   d) Make it **Formulaic**.




7. Enter the formula required.


Formula
case
when [status] = 'DENIED' then 0
when [status] = 'APPROVED' or [status] = 'REQUESTED' then [projectResourceSettings.costPerHour] * [durationInMinutes]/60
else
case
when datediff([dateRange.start], [cancelled]) >= 7 then 0
when datediff([dateRange.start], [cancelled]) >= 2 then 0.2*[projectResourceSettings.costPerHour] * [durationInMinutes]/60
else 0.5*[projectResourceSettings.costPerHour] * [durationInMinutes]/60
end
end

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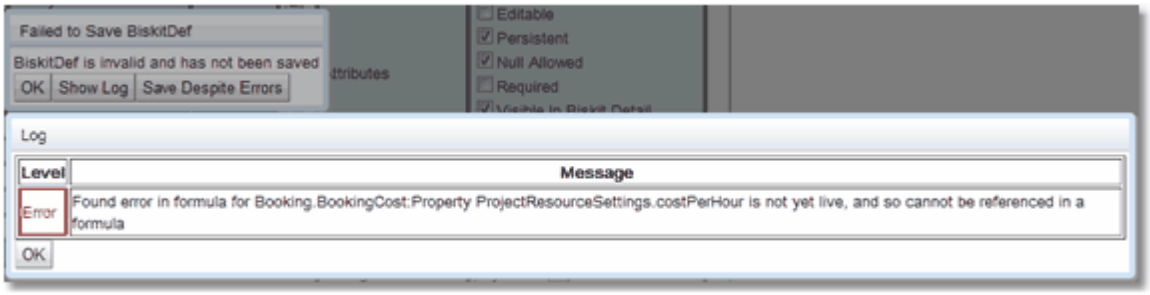
8. Press the **Save** button. An error box will appear:




   Check the error by pressing **Show Log**. If the error is complaining about a *property* not being live yet then press the **OK** button, and then the **Save Despite Errors** button.

9. As this is adding a formulaic *property* we only need to reload the database configuration.
   **a)** Press **Reload Database Configuration**, to load the new database into **Exprodo DB**
   b) Refresh the browser

Go and check *bookings* to see if the **Booking Cost** is present. In this case if when viewing a *booking* in the *Booking Calendar*[250] at the bottom of the **Booking** will appear the **Booking Cost**.

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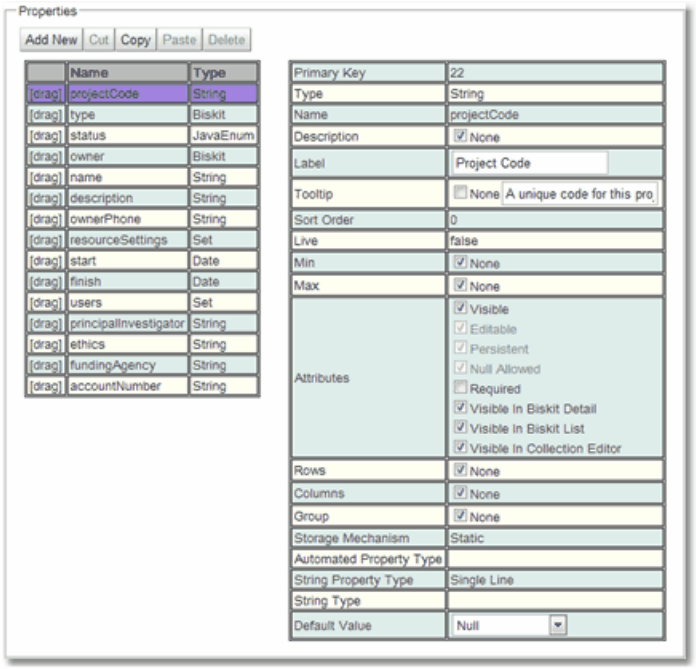
#### 4.9.5.1.3 Adding Properties For File Attachments

An example of adding a *property*[252] to the *Biskit*[250] of type **Project** to hold an file attachment.

1. Go to **Admin->Bakery**,
2. Press the **Open All** button to open the **Biskit Tree**
3. Select the *Biskit* to add *properties* to (in this case **Project**)
4. Press the **Edit** button to get the *Biskit* into edit mode




5. Press the **Add New** button to add a new *property*.

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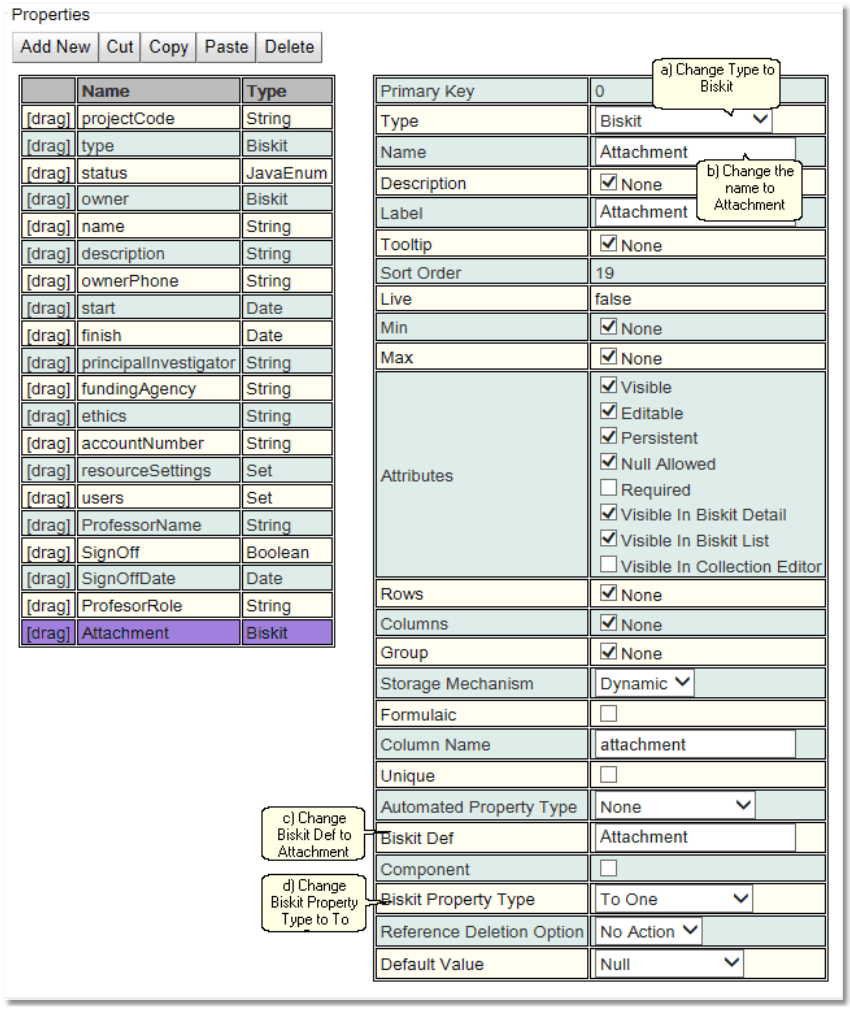


6. Update the *meta properties*[251] of the *property*.
   a) Change **Type** to **Biskit**.
   b) Give the *property* a name, in this case **Attachment.**
   c) Change **Biskit Def** to **Attachment**
   d) Change **Biskit Property Type** to **To One**.
7. Press the **Save** button.
8. If there are no errors then update the database:
   a) Press **Update DB Schema** to implement changes in the DB, a pop up will appear defining the database changes to be implemented.
9. Press the **Apply Changes** button to update the database. There will be a response saying how many rows affected. Press **OK** to finish.
   a) Press **Validate Biskits** button to check the database *Biskits*.
   b) Press **Reload Database Configuration**, to load the new database into **Exprodo DB**
   c) Refresh the browser

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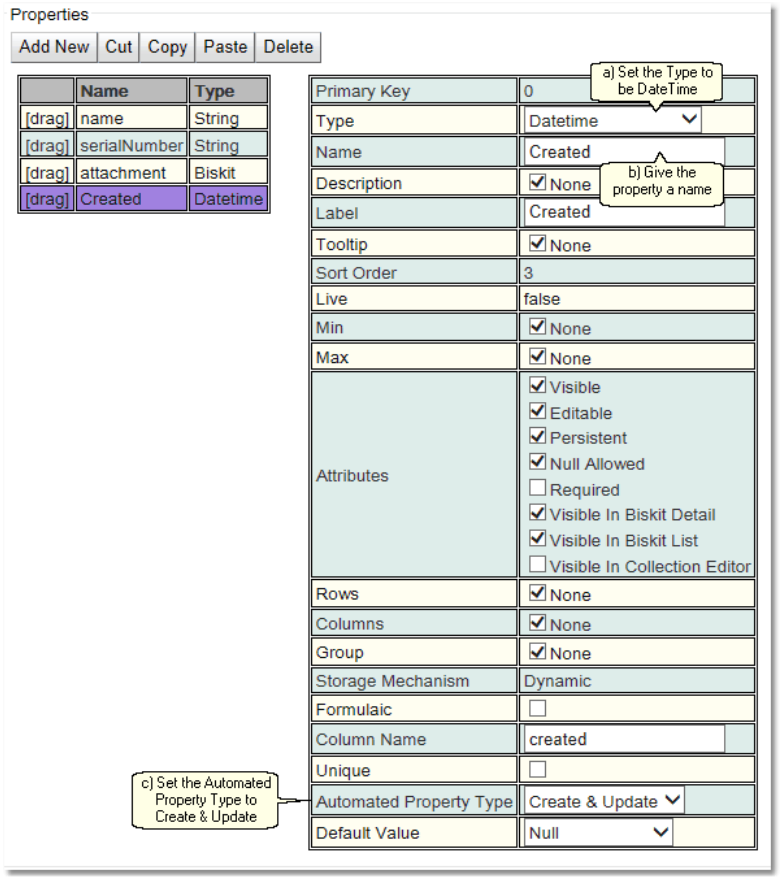
#### 4.9.5.1.4 Adding Properties For Created/Updated/Vesion

An example of adding a *properties*[252] to a *Biskit*[250] created by a user to record when a *Biskit* was created, updated and store which version is currently in use.

1. Go to **Admin->Bakery**,
2. Press the **Open All** button to open the **Biskit Tree**
3. Select the user created *Biskit* to add *properties* to
4. Press the **Edit** button to get the *Biskit* into edit mode
5. Press the **Add New** button to add a new *property*. First create a property called for example **Created**.




6. Update the *meta properties*[251] of the *property*.
   a) Change **Type** to **DateTime**.
   b) Give the *property* a name, in this case **Created.**
   c) Change **Automated Property Type** to **Create & Update**.
7. Do the same again to create a *property* for example called **Updated**.
8. And again to create a *property* for example called **Version**, this time make it of **Type Int**.

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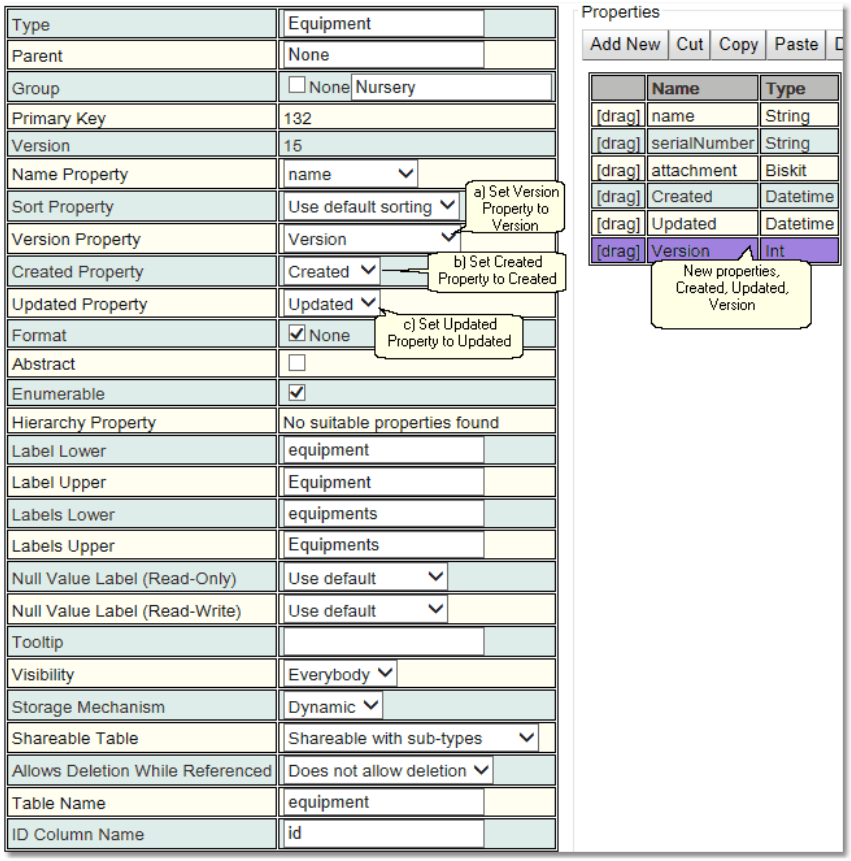


9. Set up the meta-property information
   a) Set **Version Property** meta-property to **Version**.
   b) Set **Created Property** meta-property to **Created**
   c) Set **Updated Property** meta-property to **Updated**
10. Press the **Save** button.
11. If there are no errors then update the database:
   a) Press **Update DB Schema** to implement changes in the DB,a pop up will appear defining the database changes to be implemented.
12. Press the **Apply Changes** button to update the database. There will be a response saying how many rows affected. Press **OK** to finish.
   a) Press **Validate Biskits** button to check the database *Biskits*.
   b) Press **Reload Database Configuration**, to load the new database into **Exprodo DB**
   c) Refresh the browser

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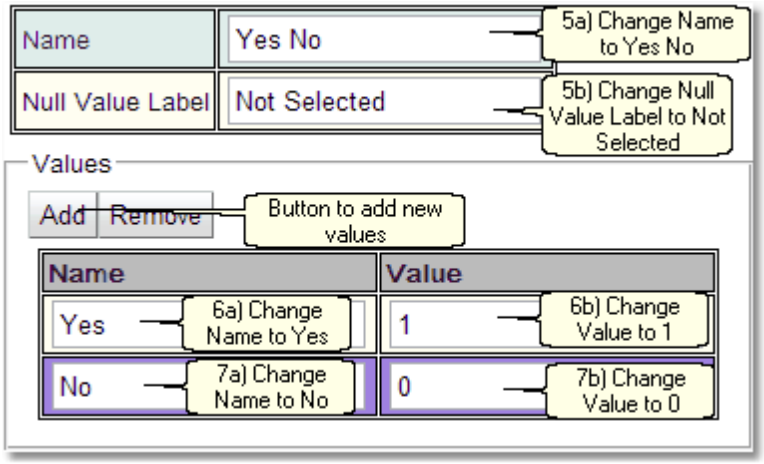
#### 4.9.5.1.5 Adding A New Yes-No Mapped Int Property

An example of adding a new *Mapped Int*[251] to the Database for use in integer *properties*[252], giving **Yes-No** as the drop down values rather than **True-False**.

1. Go to **Admin->Bakery**,
2. Open up the **Mapped Int** tree
3. Select one of the *Mapped Int's*
4. Press the **Create** button to create a new *Mapped Int*
5. Update the *meta properties*[251].
   *a)* Change **Name** to **Yes No**
   *b)* Change **Null Value Label** to **Not Selected**
6. Use the **Add** button under **Values** to create a new value
   *a)* Change **Name** to **Yes**
   *b)* Change **Value** to **1**
7. Use the **Add** button under **Values** to create a new value
   *a)* Change **Name** to **No**
   *b)* Change **Value** to **0**




8. Press the **Save** button
9. Refresh the browser
10. Press the **Open All** button to open the **Biskit Tree**
11. Select the *Biskit*[250] to add *properties*[252] to (in this case **Project**)
12. Press the **Edit** button to get the *Biskit* into edit mode
13. Press the **Add New** button to add a new *property*.

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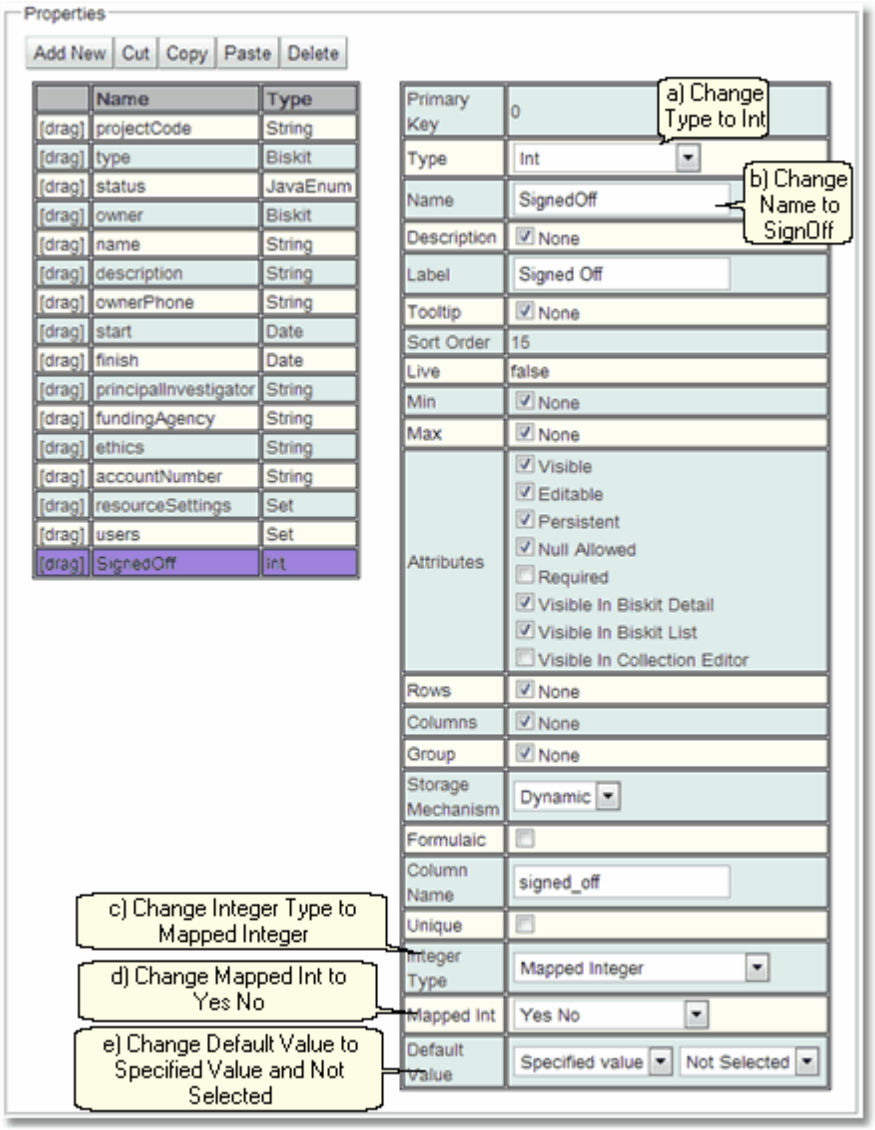
14. Update the *meta properties* of the *property*
    a) Change **Type** to **Int**.
    b) Change **Name** to something relevant (in this case **SignedOff**)
    c) Change **Integer Type** to **Mapped Integer**
    d) Change **Mapped Int** to **Yes No**.
    e) Change **Default Value** to **Specified Value** and **Not Selected**




*15.* Press the **Save** button. Press **Save Despite Errors** if required.
*16.* If there are no errors the database needs to be updated:
    a) Press **Update DB Schema** to implement changes in the DB, and then run the script to apply the changes
    b) Press **Validate Biskits** button to check the database *Biskits*
    c) Press **Reload Database Configuration**, to load the new database into **Exprodo DB**
    d) Refresh the browser

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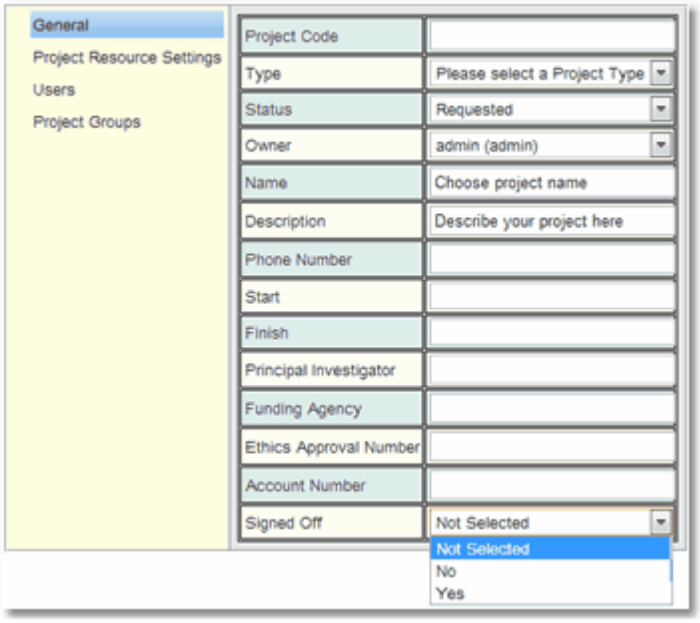
Looking at a **Project** *BiskitDef*[250] in the **Create Project** view we see:




The **Default Value** could have been set up as either **No** or **Yes**, rather than **Not Selected**, also the order the values appear depends on the order of the *Mapped Int*, so if **No** has a higher value than **Yes** it will appear below **Yes.**

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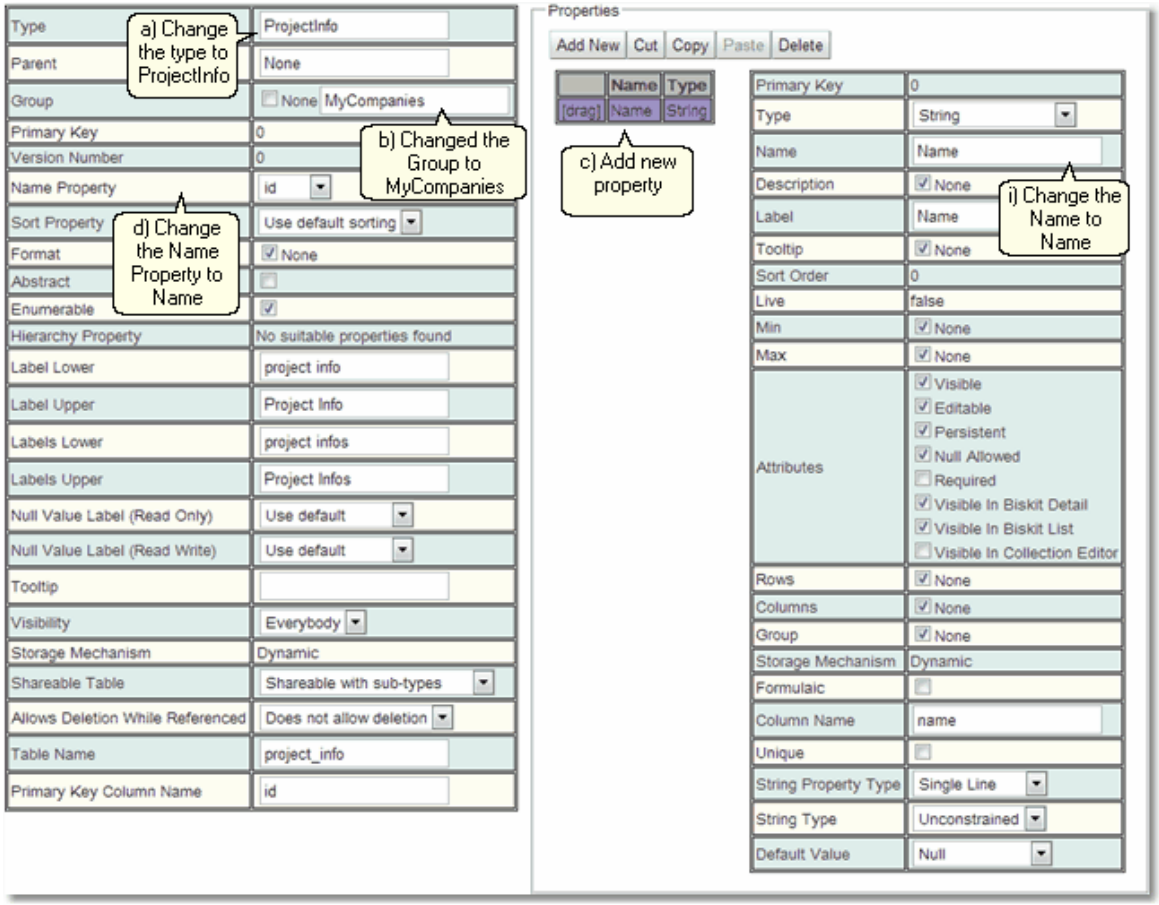
#### 4.9.5.1.6 Creating A New Basic BiskitDef

An example of creating a *BisketDef*[250] called **ProjectInfo** which has one *property*[252] called **Name** which is of type **String**.

1. Go to **Admin->Bakery**.
2. Press the **Open All** button to open the **Biskit Tree**.
3. Select any *Biskit*[250].
4. Press the **Create** button to create a new *Biskit* and enter edit mode.
5. Update the *meta-properties*[251] of the *Biskit*.
   a) Change **Type** to be the new *BiskitDef* name, in this case **ProjectInfo**
   b) Change **Group** to help with finding all the new *BisketDefs* using the **Filter Biskit Group...** button
   c) In Properties **Add New**
      i. Change **Name** to **Name**
   d)Change **Name Property** on the *BisketDef* to point to the new **Name** *property*




6. Press the **Save** button.
7. If there are no errors the database will need to be updated:
   a) Press **Update DB Schema** to implement changes in the DB, and then run the script to apply the changes
   b) Press **Validate Biskits** button to check the database *Biskits*.
   c) Press **Reload Database Configuration**, to load the new database into **Exprodo DB**
   d) Refresh the browser

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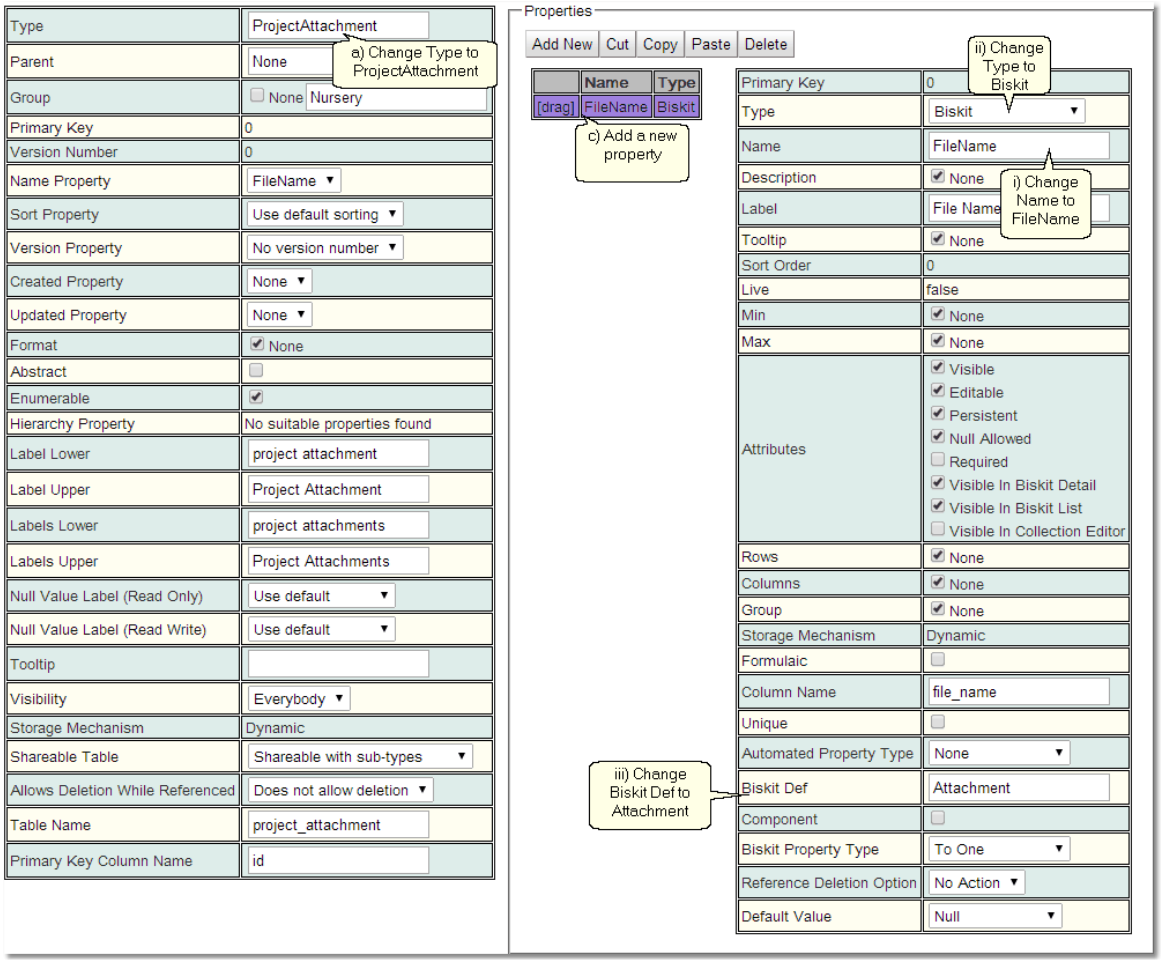
### 4.9.5.1.7 Creating A Set Of BiskitDef (Attachments)

An example of creating a Set of *BiskitDef*[250], for this example we will create a Set of Attachments, to store a number of documents.

1. Go to **Admin->Bakery**.
2. Press the ***Open All*** button to open the **Biskit Tree**.
3. Select any *Biskit*[250].
4. Press the **Create** button to create a new *Biskit* and enter edit mode. First we need to create the *BiskitDef* to hold the attachments.
5. Update the *meta-properties*[251] of the *Biskit*.
   a) Change **Type** to be the new *BiskitDef* name, in this case **ProjectAttachment**.
   b) Change **Group** to help find all the new *BisketDefs* using the **Filter Biskit Group...** button
   c) In **Properties Add New**
      i. Change **Name** to **FileName**
      ii. Change **Type** to **Biskit**
      iii. Change **Biskit Def** to **Attachment**

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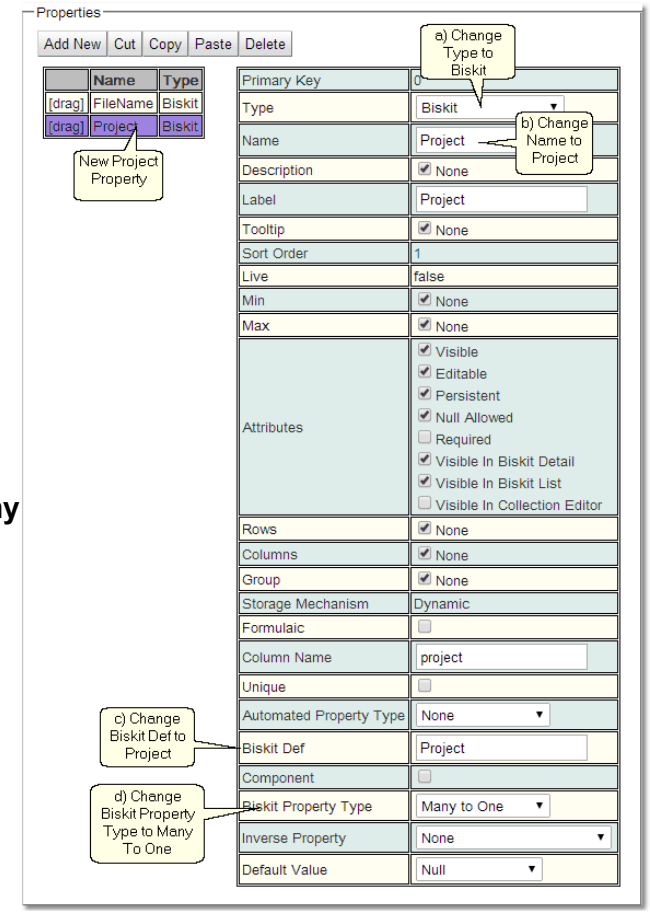
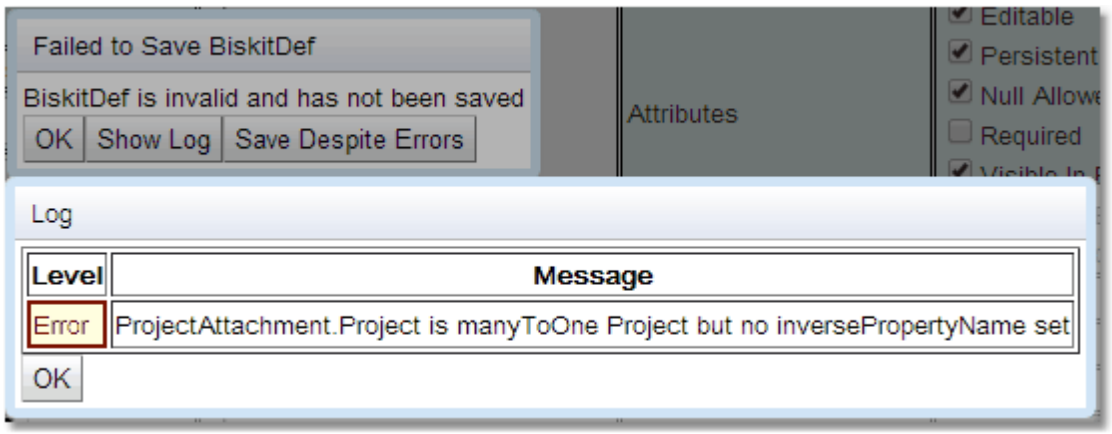
6. Create a new *property*.
   a) Change **Type** to **Biskit**.
   b) Change **Name** to **Project**
   c) Change **Biskit Def** to **Project**
   d) Change **Biskit Property Type** to **Many To One**.




7. Press the **Save** button. There will be an error:




Check the error by pressing **Show Log**. If the error is complaining about a no inversePropertyName being set press the **OK** button, and then the **Save Despite Errors** button.

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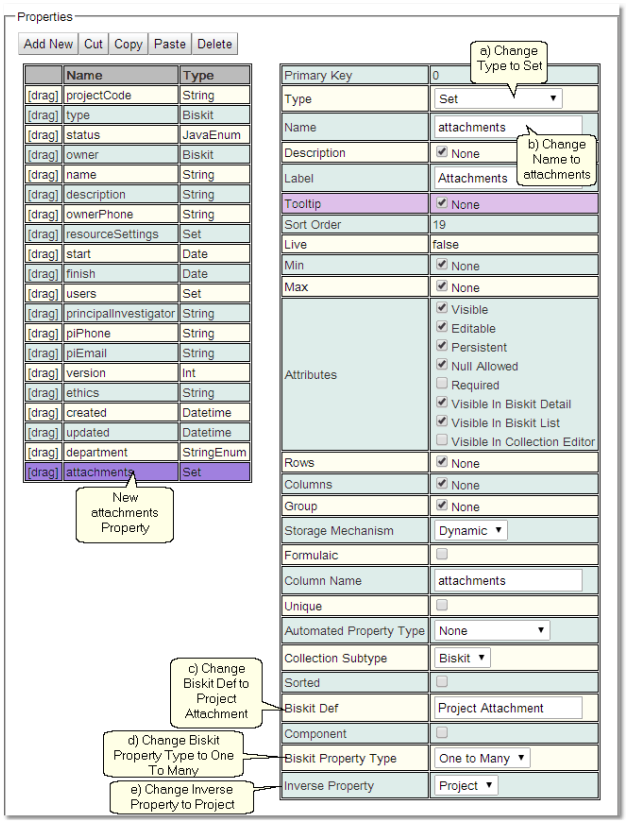
8. Select the **Project** *BiskitDef,* press the **Edit** button to get back into edit mode.

9. In **Properties Add New**.
   a) Change **Type** to **Set**.
   b) Change **Name** to **attachments**
   c) Change **Biskit Def** to **Project Attachment**
   d) Change **Biskit Property Type** to **One To Many**
   e) Change **Inverse Property** to **Project**




10. Press the **Save** button, and this should save without an error.

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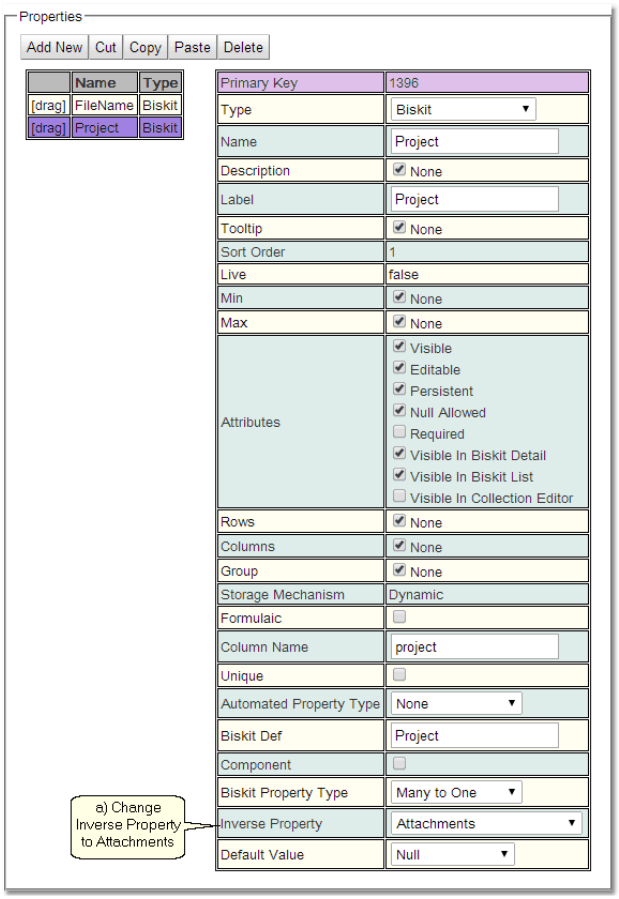
11. Select the **Project Attachment** *BiskitDef,* press the **Edit** button to get back into edit mode.

12. Select the **Project** *property*.
    a) Change **Inverse Property** to **Attachments**.




13. Press the **Save** button.
14. If there are no errors the database will need to be updated:
    a) Press **Update DB Schema** to implement changes in the DB, and then run the script to apply the changes
    b) Press **Validate Biskits** button to check the database *Biskits*.
    c) Press **Reload Database Configuration**, to load the new database into **Exprodo DB**
    d) Refresh the browser

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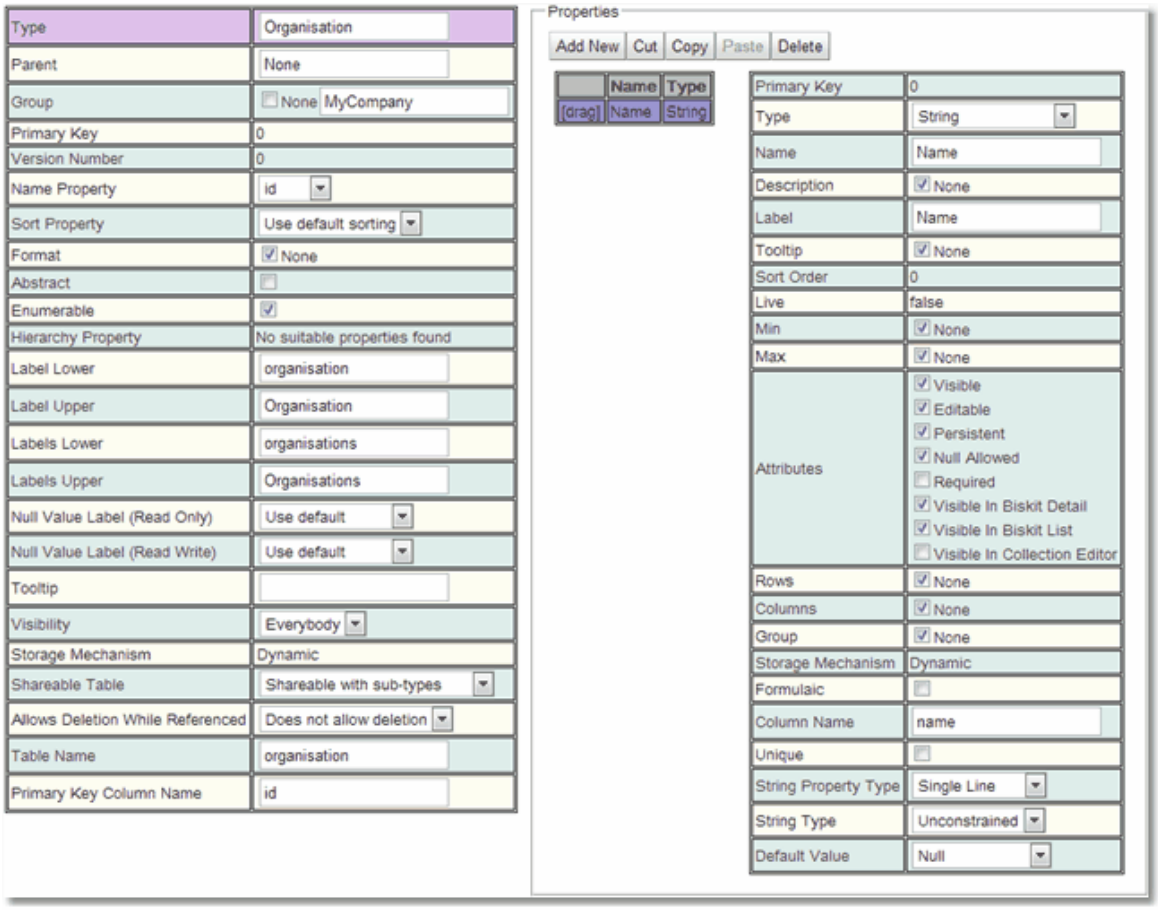
#### 4.9.5.1.8 Creating A Hierarchy Of BiskitDef

An example of creating a hierarchy of *BiskitDef*[250] similar to **Location**. Where a parent can have many children of the same type of *BiskitDef* and a child will have only one parent. We will create one called **Organisation**.

1. Go to **Admin->Bakery**.
2. Press the ***Open All*** button to open the **Biskit Tree**.
3. Select any *Biskit*[250].
4. Press the **Create** button to create a new *Biskit* and enter edit mode.
5. Update the *meta-properties*[251] of the *Biskit*.
   a) Change **Type** to be the new *BiskitDef* name, in this case **Organisation**.
   b) Change **Group** to help find all the new *BisketDefs* using the **Filter Biskit Group...** button
   c) In **Properties Add New**
      i. Change **Name** to **Name**
   d)Change **Name Property** on the *BisketDef* to point to the new **Name** *property*[252]

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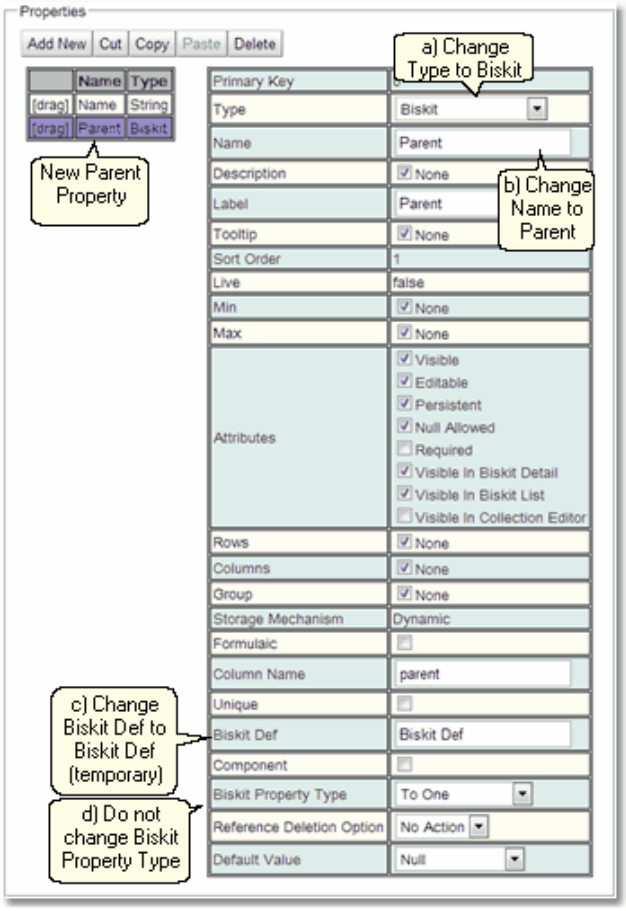
6. Create a new *property*.
   a) Change **Type** to **Biskit**.
   b) Change **Name** to **Parent**
   c) Change **BiskitDef** to *BiskitDef* (**Organisation** is not know yet because we have not saved so use this as a holder)
   d) Leave **Biskit Property Type** as **To One**.

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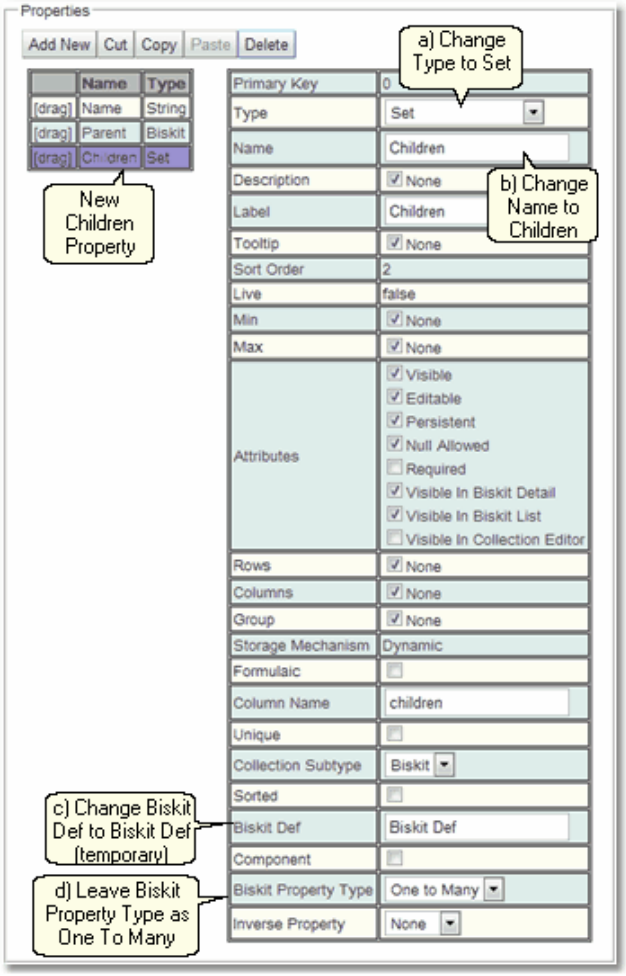
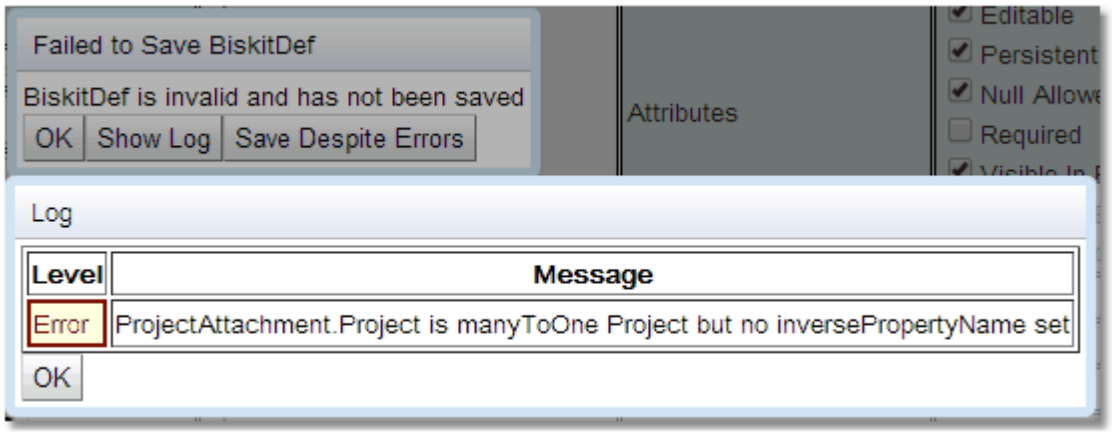
7. Create a new *property*
   a) Change **Type** to **Set**.
   b) Change **Name** to **Children**
   c) Change **BiskitDef** to *BiskitDef* (**Organisation** is not know yet because we have not saved so use this as a holder)
   d) Leave **Biskit Property Type** as **One To Many**




8. Press the **Save** button. There will be an error:




Check the error by pressing **Show Log**. If the error is complaining about a *property* not having the correct *BisketDef* press the **OK** button, and then the **Save Despite Errors** button.

9. Press the **Edit** button to get back into edit mode.

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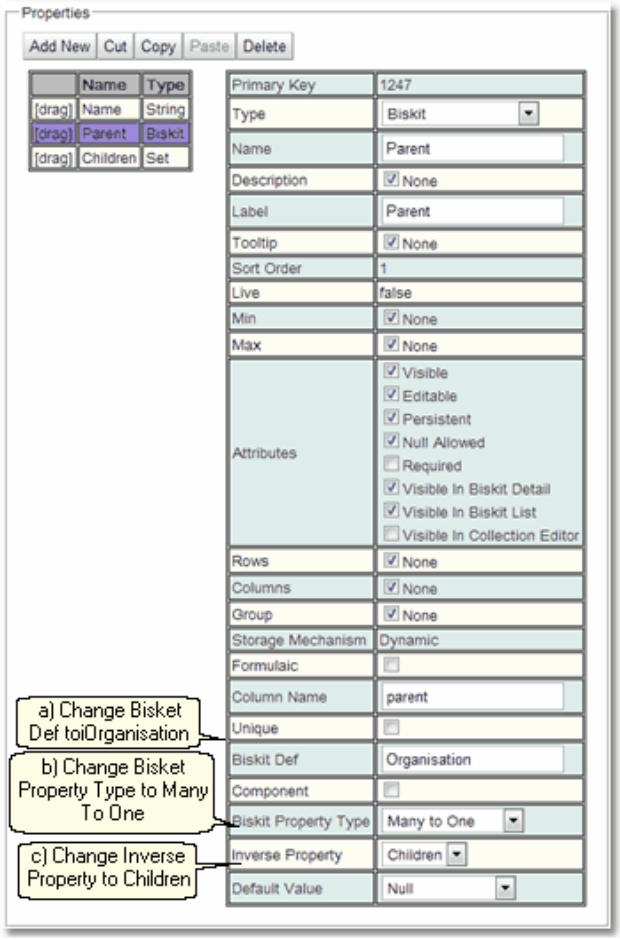
*10.*Select the **Parent** *property*
a) Change **BisketDef** to **Organisation**.
b) Change **Biskit Property Type** to **Many To One**
c) Change **Inverse Property** to **Children**




11.Press the **Save** button, there will be an error, **Save Despite Error**. This is needed so that when the **Children** property is set up it finds the completed **Parent** *property* to set up **Inverse Property**
12.Press the **Edit** button to get back into edit mode.

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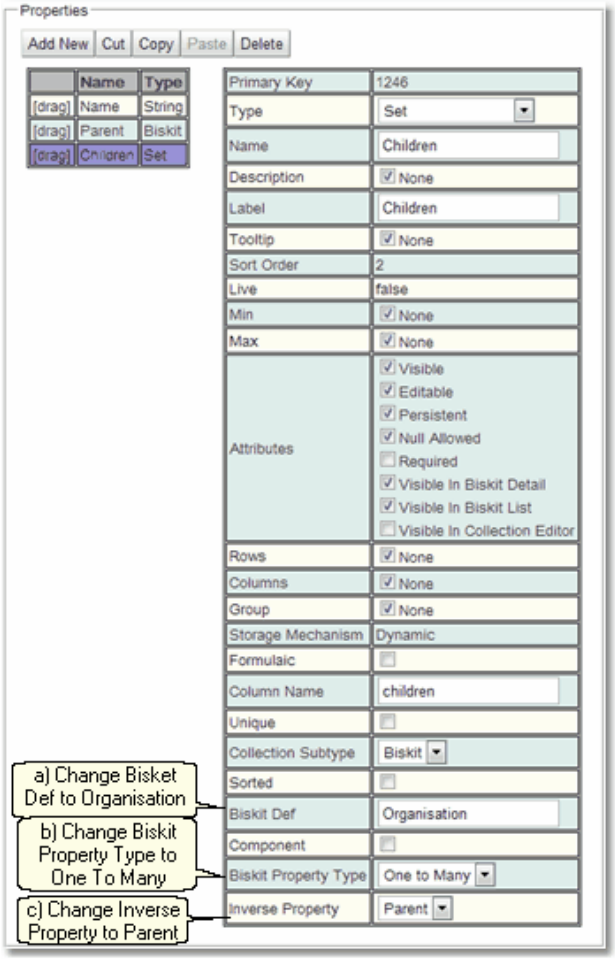
13. Select the **Children** *property*.
    *a)* Change **BisketDef** to **Organisation**.
    *b)* Change **Biskit Property Type** to **One To Many**
    *c)* Change **Inverse Property** to **Parent**




14. Change the **Hierarchy Property** *meta-property* of the **Organisation** *Biskit* to be **children**.
15. Press the **Save** button.
16. If there are no errors the database will need to be updated:
    a) Press **Update DB Schema** to implement changes in the DB, and then run the script to apply the changes
    b) Press **Validate Biskits** button to check the database *Biskits*.
    c) Press **Reload Database Configuration**, to load the new database into **Exprodo DB**
    d) Refresh the browser

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#### 4.9.5.1.9 Creating A Master-Slave Biskit Relationship

An example of creating a **Master-Slave** *Biskit*[250] relationship. This type of relationship is needed if there are going to be a large number of pieces of data to be stored in effectively one table. MySQL has a limit of about 1000 columns to a table, so if more are needed, *Biskits* that are completely linked together will need to be created. Where if a record is created in one an equivalent record will be created in the other and they will be referenced through the same key.

The **Master-Slave** that will be created will have only one *property*[252] on the **Master** (**Name** of type **String**), once this has been created then all the *properties* needed, can be added to each of the *Biskits*. A **Master** could have many **Slave** *Biskits* as required, a *property* needs to be set up on the **Master** to point to each **Slave**. Each **Slave** just needs one *property* to point to the **Master**. The **Primary Key Column Name** in the **Slave** MUST be different to that in the **Master**. If there are multiple **Slaves** then the **Primary Key Column Name** in each **Slave** MUST be different.

1. Go to **Admin->Bakery**.
2. Press the **Open All** button to open the **Biskit Tree**.
3. Select any *Biskit*.
4. Press the **Create** button to create a new *Biskit* and enter edit mode.

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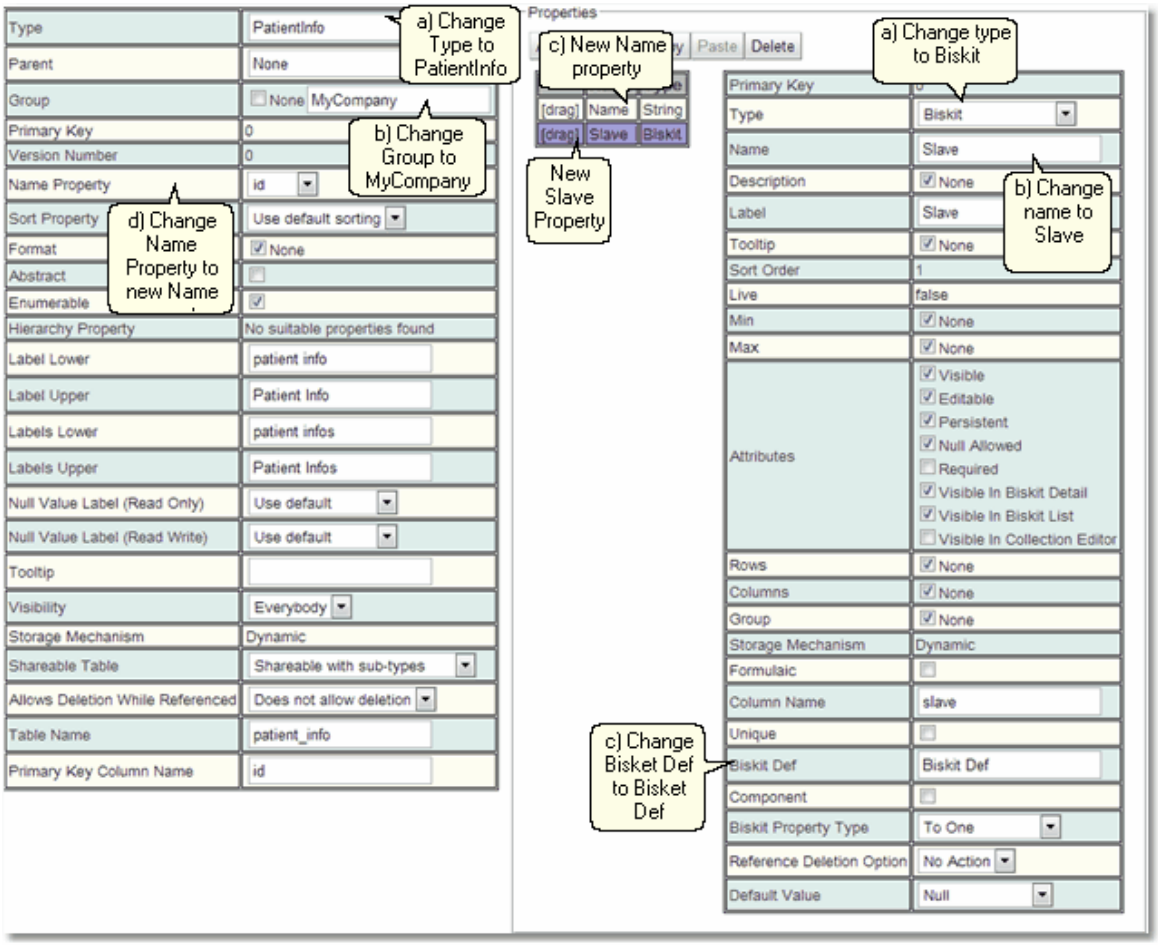
5. Update the *meta-properties*[251] of the *Biskit*.
   a) Change **Type** to be the new *BiskitDef*[250] name, in this case **PatientInfo**.
   b) Change **Group** to make it easy *to* find all the new *BisketDefs* using the **Filter Biskit Group...** button
   c) In **Properties Add New**
      i. Change **Name** to **Name**
   d)Change **Name Property** on the *BisketDef* to point to the new **Name** *property*
6. Create a new *property*.
   a) Change **Type** to **Biskit**.
   b) Change **Name** to **Slave**.
   c) Change **Biskit Def** to **Biskit Def** (The other *BisketDef* is not know yet because we have not created it so use this as a holder).




7. Press the **Save** button.

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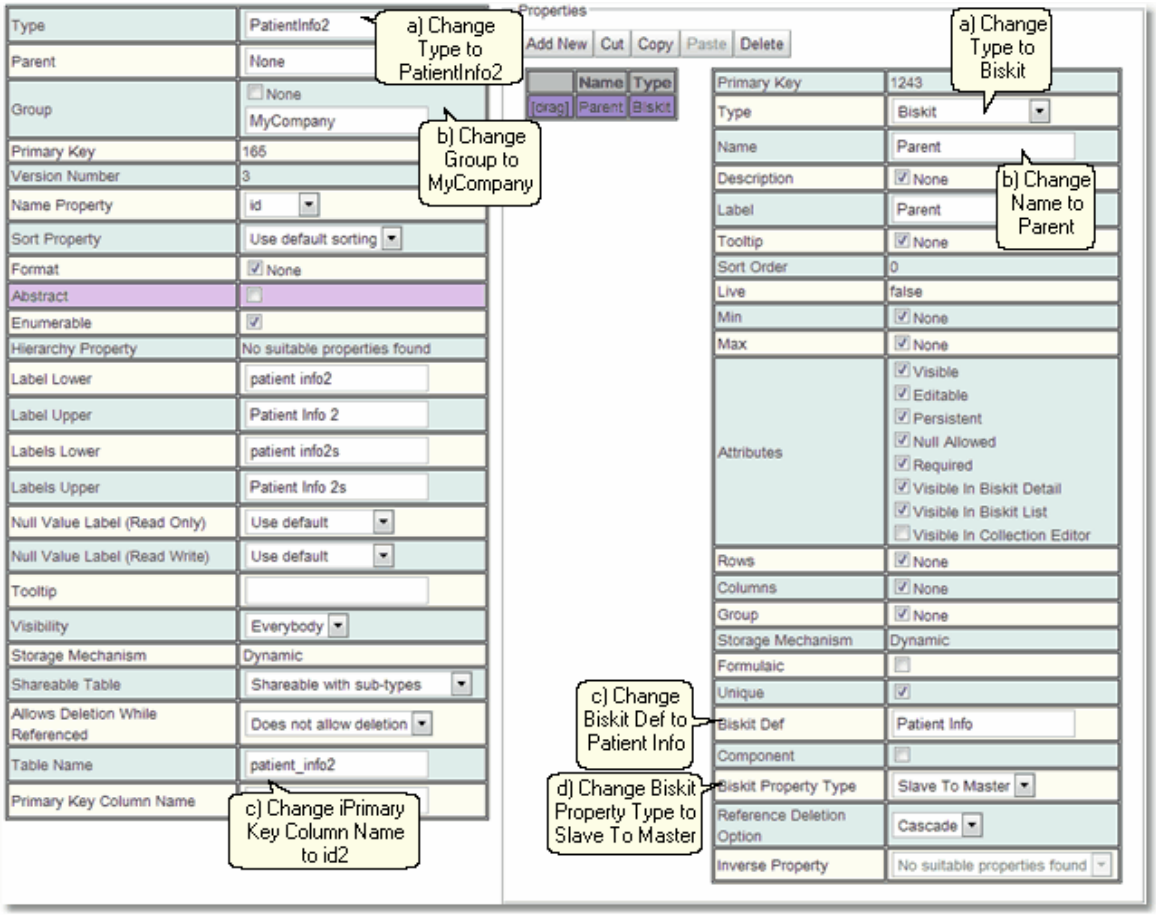
8. Press the **Create** button to create a new *Biskit* and enter edit mode.
9. Update the *meta-properties* of the *Biskit*.
   a) Change **Type** to be the new *BiskitDef* name, in this case **PatientInfo2**
   b) Change **Group** to make it easy *to* find all the new *BisketDefs* using the **Filter Biskit Group...** button
   c) Change **Primary Key Column Name** to id1 (must be different from the **Master** *BiskitDef* **Primary Key Column Name**)
10. Create a new *property*.
   a) Change **Type** to **Biskit**.
   b) Change **Name** to **Parent**
   c) Change **BiskitDef** to **Patient Info**
   d) Change **Biskit Property Type** to **Slave To Master**


a) Change Type to PatientInfo2
b) Change Group to MyCompany
c) Change iPrimary Key Column Name to id2
a) Change Type to Biskit
b) Change Name to Parent
c) Change Biskit Def to Patient Info
d) Change Biskit Property Type to Slave To Master

*11.* Press the **Save** Button. There will be an error, **Save Despite Errors**.

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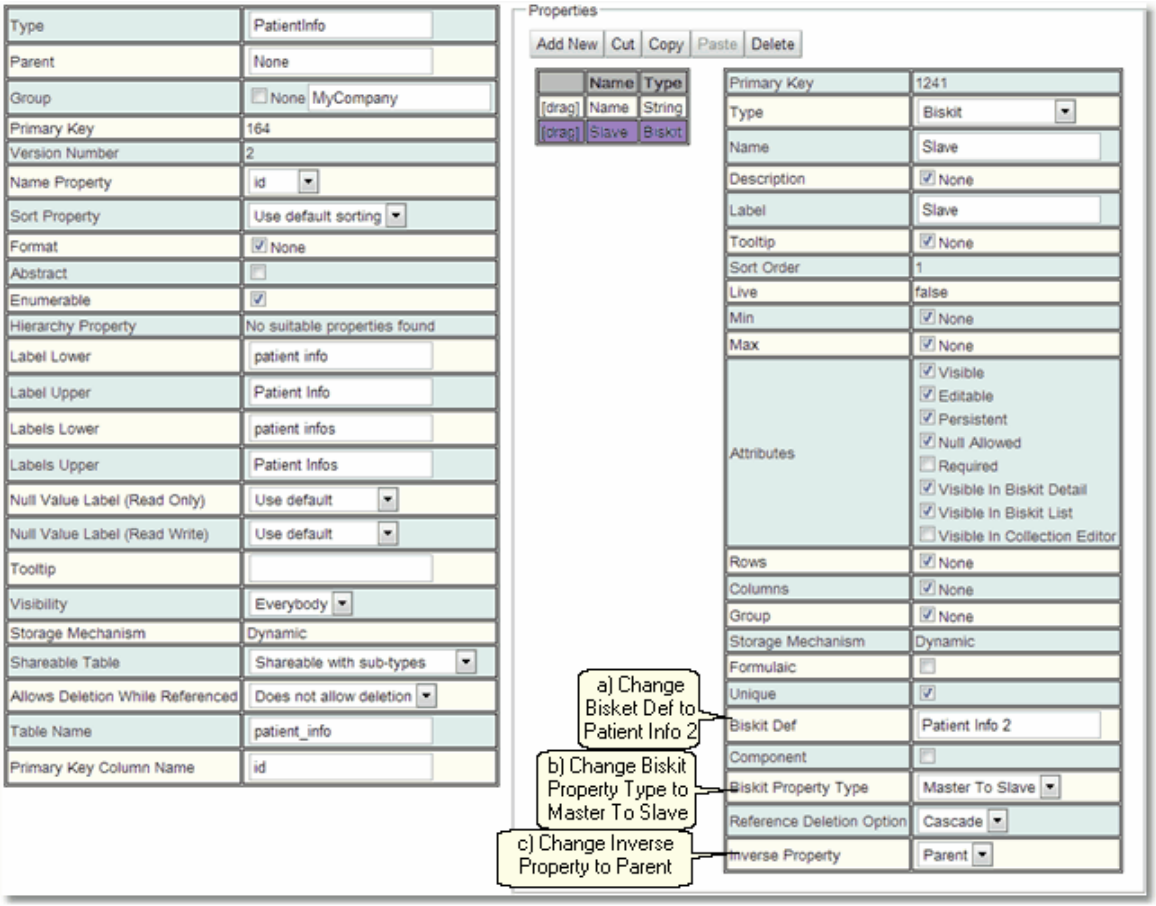
*12.*Select the **PatientInfo** *Biskit* and press the **Edit** button to get back into edit mode.
13.Select the **Slave** *property*.
a) Change **Bisket Def** to **PatientInfo2**.
b) Change **Biskit Property Type** to **Master To Slave**
c) Change **Inverse Property** to **Parent**




*14.*Press the **Save** button. There will be an error, **Save Despite Errors**.

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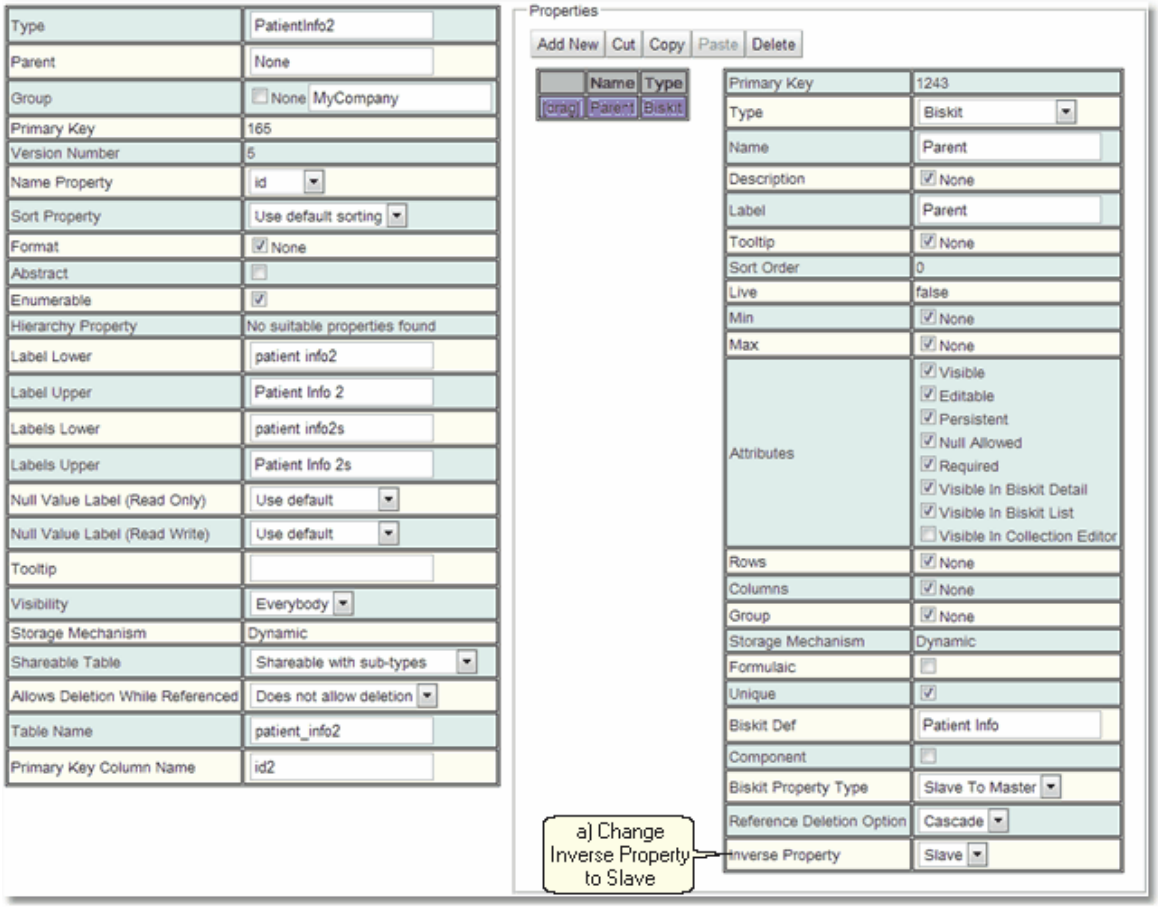
*15.* Select the **PatientInfo2** *Biskit* and press the **Edit** button to get back into edit mode.
*16.*Select the **Parent** *property*.
**a)** Change **Inverse Property** to **Slave**




17.Press the **Save** button.
18.If there are no errors the database will need to be updated:
a) Press **Update DB Schema** to implement changes in the DB, and then run the script to apply the changes
b) Press **Validate Biskits** button to check the database *Biskits*
c) Press **Reload Database Configuration**, to load the new database into **Exprodo DB**
d) Refresh the browser

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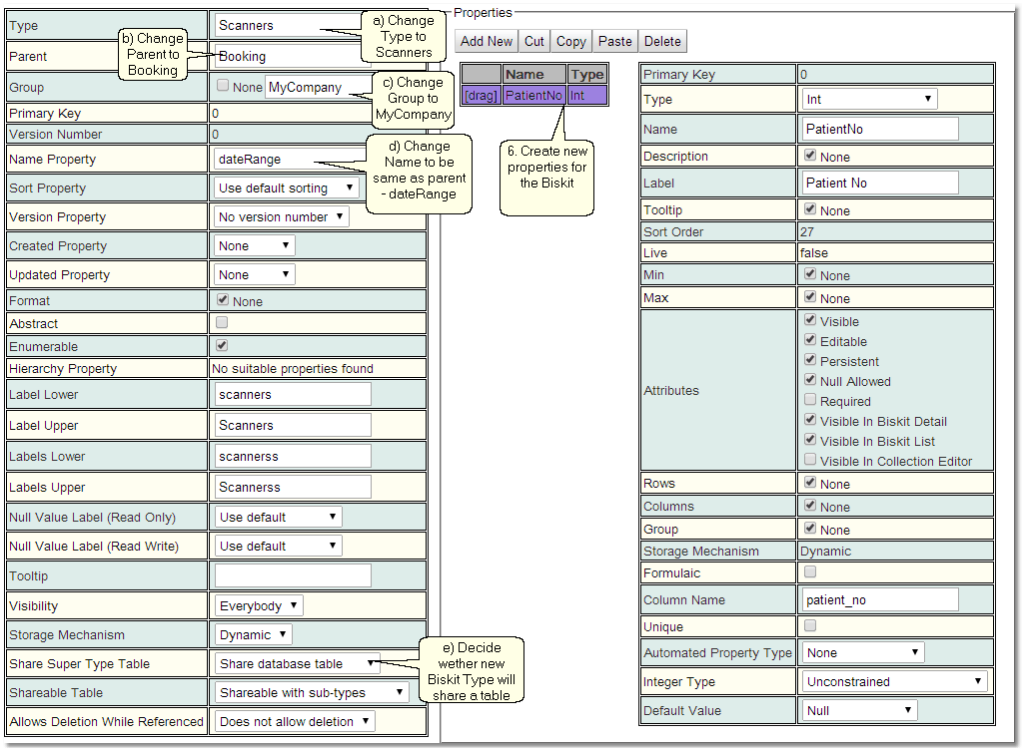
#### 4.9.5.1.10 Creating An Inheriting BiskitDef (Booking)

An example of creating a *Biskit*[250] that inherits from another *Biskit*. In this case **Resource**. Please note that when editing the new *Biskit* the user cannot see the *properties*[252] that it inherits from the parent *Biskit*.

1. Go to **Admin->Bakery**.
2. Press the **Open All** button to open the **Biskit Tree**.
3. Select any *Biskit*.
4. Press the **Create** button to create a new *Biskit* and enter edit mode.
5. Update the *meta-properties*[251] of the *Biskit*.
   a) Change **Type** to be the new *BiskitDef*[250] name, in this case **ExtendedResource**.
   b) Change **Parent** to **Resource**
   c) Change **Group** to make it easy *to* find all the new *BisketDefs* using the **Filter Biskit Group...** button
   d) Decide whether new *BiskitDef* will share a table with its parent by changing **Share Super Type Table** (it is best if they do share a table).
   e) In **Properties Add New**
      i. Change **Name** to **LastBreakdown**
      ii. Change **Type** to **Date**
   f) Change **Name** *property* on the *BiskitDef* to point to the **Name** *property* of the parent




6. Press the **Save** button.
7. If there are no errors the database will need to be updated:
   a) Press **Update DB Schema** to implement changes in the DB, and then run the script to apply the changes
   b) Press **Validate Biskits** button to check the database *Biskits*
   c) Press **Reload Database Configuration**, to load the new database into **Exprodo DB**
   d) Refresh the browser

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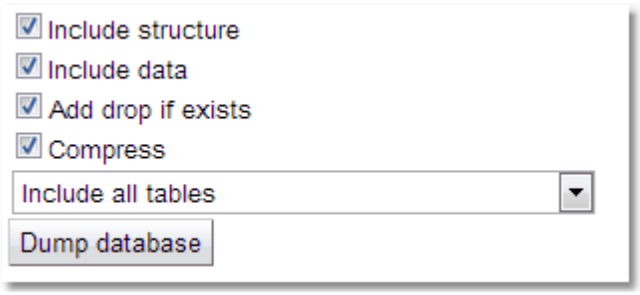
## 4.10 Backing Up The Database

To take a backup of the database, use the **Database Dump** page, which is by default on the menu as **Admin-->Database Dump**.




Before asking for the backup, there are the following options:

| Option | Description | |
|---|---|---|
| Include structure | If ticked, the backup will contain SQL statements that will create the database tables. | |
| Include data | If ticked, the backup will contain SQL statements containing the data from the database. | |
| Add drop if exists | If ticked, the before each database table is created, a statement is added to drop that table if it already exists. | |
| Compress | If ticked, the backup will be compressed before being downloaded. | |
| Include all tables | This drop down allows the choice of one of the following options: | |
| | **Option** | **Description** |
| | Include all Tables | Dumps all tables |
| | Include all tables except history and statistics | Dumps all tables except history and statistics |
| | Select Tables | Provides a simple choice of tables to be dumped. |
| | Use Custom per-table settings | See below for complete description |

When all the settings are as required, just press the **Dump database** button to initiate the backup. When the backup is complete, the browser should download the backup file. **Exprodo DB** limits how often a database backup may be taken, by setting **Minimum time between database backups** on the General tab of the Global Preferences.

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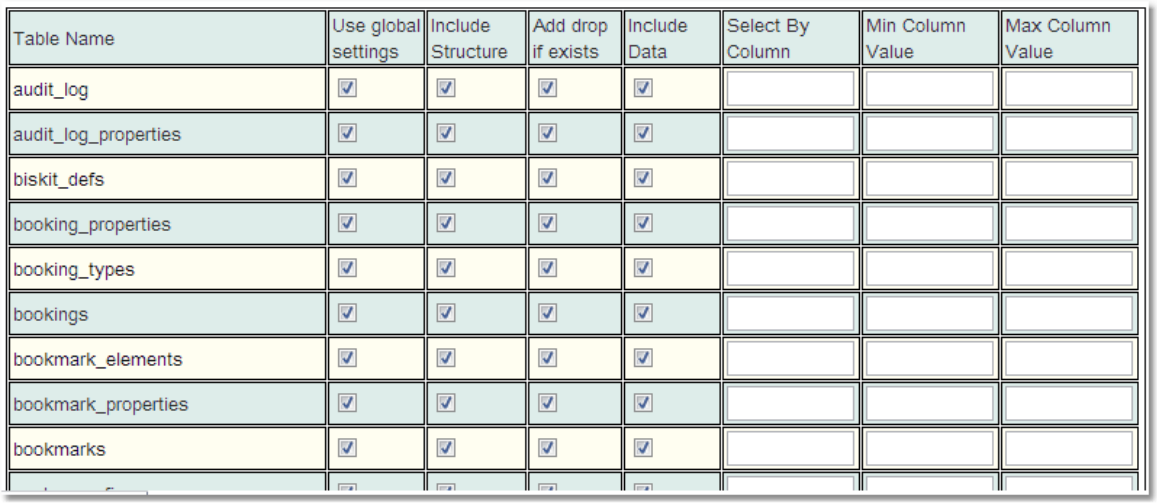
## Use Custom Per-Table Settings

If the **Use Custom per-table settings** option is chosen, then **Exprodo DB** will get a list of all the tables in the database and allow the way each table is backed up to be customised.



| Table Name | Use global settings | Include Structure | Add drop if exists | Include Data | Select By Column | Min Column Value | Max Column Value |
|---|---|---|---|---|---|---|---|
| audit_log | ☑ | ☑ | ☑ | ☑ | | | |
| audit_log_properties | ☑ | ☑ | ☑ | ☑ | | | |
| biskit_defs | ☑ | ☑ | ☑ | ☑ | | | |
| booking_properties | ☑ | ☑ | ☑ | ☑ | | | |
| booking_types | ☑ | ☑ | ☑ | ☑ | | | |
| bookings | ☑ | ☑ | ☑ | ☑ | | | |
| bookmark_elements | ☑ | ☑ | ☑ | ☑ | | | |
| bookmark_properties | ☑ | ☑ | ☑ | ☑ | | | |
| bookmarks | ☑ | ☑ | ☑ | ☑ | | | |

For each table, there are the following options:

| Option | Description |
|---|---|
| Use global settings | If ticked, then the other options for this table will be ignored. |
| Include structure | Allows the global setting of **Include structure** for this table to be overridden. |
| Add drop if exists | Allows the global setting of **Add drop if exists** for this table. |
| Include data | Used to override the global setting of **Include data** for this table to be overridden. |
| Select by column | If partial data is to be downloaded, then the user can nominate a column of the table and specify minimum and/or maximum values of that column that should be included in the download. |
| Min Column Value | If the user wants to download partial data and specifies **Select by column**, then the **Min column** value is the minimum value of the selected column that should be included in the download. |
| Max Column Value | If the user wants to download partial data and specifies **Select by column**, then the **Max column value** is the maximum value of the selected column that should be included in the download. |

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# Part V

# 5 Exprodo DB Installation Guide

If your **Exprodo DB** is to be hosted on **exprodo.com**, then you will not need to read these instructions as it will be installed for you. You only need to read this installation guide if you are going to install **Exprodo DB** on your own server.

## Hardware and Software Requirements

**Operating system**

- Windows
- MacOS
- Linux

**Server Software**

- Java 7 minimum (when we add support for HTTP/2, this will require Java 8)
- MySQL 5.1 minimum (or MariaDB equivalent)
- Tomcat 7 minimum
- Apache HTTP Server (tested on 2.2 and 2.4, although any version should work)

**Server Hardware**

- RAM 4GB minimum, 8GB recommended
- Hard Disk 10GB minimum, but requirements depend on usage, particularly if you configure the system to store file uploads.
- Recent & fast CPU recommended
- Both 32 bit and 64 bit supported
- You can use a virtualised server if required

**Client Software**

- Chrome - any version, but recent versions preferred
- FireFox - any version, but recent versions preferred
- Safari - any version, but recent versions preferred
- IE 9 or later (IE8 mostly works but is extremely slow)

**Expected Future Changes**

We expect the following changes to occur to our requirements:

- Tomcat: Some time during 2015 or 2016, we expect to drop the requirement for the use of Tomcat. We expect to replace Tomcat with Jetty, which we will bundle with our software.
- Java: Java 6 and Java 7 are both no longer receiving public updates from Oracle. Further, when we add support for HTTP/2 (which will coincide with dropping the requirement for Tomcat), HTTP/2 will only work with Java 8, and so we may require the use of Java 8 at that time.

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## Requirements

You should have received a file archive that contains the following files:

```
db-x.y.z.sql
DB/
INSTALL/apache/ssl-www.calpendo.com
INSTALL/apache/www.calpendo.com
INSTALL/apache_with_mod_jk/ssl-www.calpendo.com
INSTALL/apache_with_mod_jk/mod_jk.conf
INSTALL/apache_with_mod_jk/singleTomcatInstance/ssl-www.calpendo.com
INSTALL/apache_with_mod_jk/singleTomcatInstance/workers.properties
INSTALL/apache_with_mod_jk/singleTomcatInstance/www.calpendo.com
INSTALL/apache_with_mod_jk/workers.properties
INSTALL/apache_with_mod_jk/www.calpendo.com
INSTALL/hibernate.cfg.xml
INSTALL/README.txt
INSTALL/tomcat6/conf/server.xml
INSTALL/tomcat6/conf/tomcat-users.xml
```

The **DB** directory contains the program itself, and `db-x.y.z.sql` contains a blank **MySQL** database. The other files are examples for configuring **Apache Tomcat 7** and **Apache** web server, described further below.

## Installation Overview

You will need:

- A database server, eg **MySQL**, though many other database servers will work ok
- A servlet engine, eg **Tomcat 7**, **Jetty** etc
- **Java JDK 7** (or possibly just a **JRE**, depending on the version of your servlet engine)
- An **Apache HTTP** server may be required, or else you can serve directly from the servlet engine. The config files are use **Apache HTTP** server as a front end to **Tomcat**.
- A database. If using **MySQL**, then you can load the `db-x.y.z.sql` provided. For any other database, **Exprodo DB** can be made to generate the necessary tables itself (instructions for this are not here)

Once those things are in place, you need to:

- Copy the **DB** directory into the servlet engine's `webapps` directory
- Change a configuration file so it knows how to connect to the database
- Configure the servlet engine and **Apache**
- Start the servlet engine and **Apache**
- Connect to the server from a browser to make sure it is accepting connections.

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## Install MySQL

Any version that supports **InnoDB** tables should do, but the database dump that's included in this distribution comes from **MySQL 5.5.x**. **MySQL** documentation should be consulted if loading this into any other version.

## Create The Database And A Mysql User

Open a connection to **MySQL** with:

```
mysql -u root -p
```

and then at the `mysql` prompt:

```
mysql> create database db;
mysql> grant all privileges on db.* to exprodo@localhost
    -> identified by 'somepassword';
mysql> exit;
```

You may choose a different name for the database and/or user if you wish. Later on, you will configure **Exprodo DB** so it can locate the database and log in - you will just put the connection information into a URL (in file `hibernate.cfg.xml`).

## Load The Sample Database

You should have a file called `db-x.y.z.sql` that you can load:

```
mysql -u db --password=somepassword db < db-x.y.z.sql
```

## Install A Java JDK

Follow the installation instructions for the **JDK** for your platform. This needs to be at least **JDK 7**. Note that the **JDK** is required, not just the **JRE** (this is a requirement for **Apache Tomcat**, the servlet server, rather than **Exprodo DB** itself).

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## Install A Java Servlet Server

This should be **Apache Tomcat**, or **Jetty** or some other server that supports the **Servlet 2.5** specification. **Exprodo DB** has only been tested with **Tomcat 7**, and so this is the preferred server. A future **Exprodo DB** release is likely to use **Jetty** instead (and also include a much easier installation and upgrade mechanism). The rest of this section assumes you are using **Tomcat** version **7**.

You should read and follow the standard documentation for **Tomcat** to install it. Once installed, you will need to edit two files in **Tomcat's** `conf` directory, `server.xml` and `tomcat-users.xml`. You should find samples of each of these with the **Exprodo DB** distribution. The important parts of these are:

`tomcat-users` This needs to contain a `<user...>` line so that somebody can connect to **Tomcat's** web management pages. The user name and password can be anything and will only ever be used by a human. You may want more than one entry here, depending on who will do the administration.

`server.xml` The sample provided defines a `<Connector ...>` entry on port 8080 that allows users to connect directly to **Tomcat**. A standard **Tomcat** `server.xml` would contain this entry, although I've added the necessary config so that it supports compression. If all access is to be made through **Apache**, then this connector on port 8080 could potentially be turned off. Leave it on for now so you can test the installation before we bring **Apache** into the equation.

I've also added a `<Connector...>` on port 8009 with protocol **AJP/1.3**. This is the means by which **Apache** talks to **Tomcat**.

Once done, check that you can connect to **Tomcat** and access its management pages. Go to the web page:

```
http://servername:8080/
```

where `servername` is the name of the server you installed **Tomcat** on. There should be a link on there to the management pages so you can ask **Tomcat** to start **Exprodo DB** (after **Exprodo DB** is installed).

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## Install Exprodo DB

**Exprodo DB** is delivered as a directory in war file format. However, there's a file inside the directory (`WEB-INF/classes/hibernate.cfg.xml`) that you will need to modify to tell **Exprodo DB** how to connect to the database.

The root directory in the archive is called `DB`. You should put this directory into **Tomcat's** `webapps` directory. Then edit the file

```
webapps/DB/WEB-INF/classes/hibernate.cfg.xml
```

The entries you need to configure are:

```
<property name="hibernate.connection.username">
   exprodo
</property>
<property name="hibernate.connection.password">
   somepassword
</property>
<property name="hibernate.connection.url">
   jdbc:mysql://localhost/db
</property>
<property name="hibernate.connection.driver_class">
   org.mariadb.jdbc.Driver
</property>
<property name="hibernate.dialect">
   com.springsolutions.exprodo.core.server.persistence.ExprodoMySQL5Inno
   DBDialect
</property>
```

You need to change the username, password and url to match the user and database name you created earlier.

You should now ask **Tomcat** to start **Exprodo DB** (in case it isn't done automatically). Go to the web management page, linked from:

```
http://servername:8080/
```

and see if **Exprodo DB** has started, and if not, ask for it to be started.

Once this is done, then you should test to see whether **Exprodo DB** is working with **Tomcat**. Open a web browser at this url:

```
http://servername:8080/DB/com.springsolutions.exprodo.basic.Basic/
program.html
```

All being well, you will see a **Exprodo DB** login screen. If you don't, then you'll need to check to see what errors are on screen or in the **Tomcat** logs.

If you do see the login screen, then try to log in with **username** `root` and a blank **password**.

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## Install Apache HTTP Server

Follow the **Apache** documentation as appropriate for your operating system in order to install the **Apache HTTP** server. Once installed, you should make sure your **Apache** configuration loads modules **mod_proxy**, **mod_proxy_http**, **mod_rewrite**, **mod_deflate** and **mod_ssl**. The location of your modules may vary from that shown below, so you may need to alter this sample configuration:

```
LoadModule proxy_module /usr/lib/apache2/modules/mod_proxy.so
LoadModule proxy_http_module /usr/lib/apache2/modules/mod_proxy_http.so
LoadModule rewrite_module /usr/lib/apache2/modules/mod_rewrite.so
LoadModule deflate_module /usr/lib/apache2/modules/mod_deflate.so
LoadModule ssl_module /usr/lib/apache2/modules/mod_ssl.so
```

For **mod_deflate**, you will need to add config like this:

```
<IfModule mod_deflate.c>
    AddOutputFilterByType DEFLATE text/html text/plain text/xml text/css
text/javascript
</IfModule>
```

This allows **Apache** to `gzip` the files it serves. This has a marked impact on the size of **Exprodo DB javascript** files in particular.

You will now need to configure the **Exprodo DB** aspects of **Apache**. You will have your own requirements here, but here is the configuration you will need to provide access to **Exprodo DB** from a URL of "*https://yourServer/DB*".

```
RewriteEngine On
RewriteRule ^/DB/Service(.*) /DB/com.springsolutions.exprodo.basic.Basic/Service$1
RewriteRule ^/DB/program.html(.*) /DB/com.springsolutions.exprodo.basic.Basic/prog
RewriteRule ^/DB/$ /DB/com.springsolutions.exprodo.basic.Basic/program.html [PT,L]
RewriteRule ^/DB/(.*) /DB/com.springsolutions.exprodo.basic.Basic/$1 [PT,L]
ProxyRequests Off
<Proxy *>
    Order allow,deny
    Allow from all
</Proxy>
ProxyPass /DB http://localhost:8080/DB
ProxyPassReverse /DB http://localhost:8080/DB
```

The above configuration should be placed inside a **VirtualHost** declaration. If you want to provide both **SSL** and **non-SSL** access to **Exprodo DB**, then you should place the above configuration in both the **SSL** and **non-SSL VirtualHost** areas. At this point, accessing **Exprodo DB** from "*https://yourServer/DB*" should work, possibly unless you are using an operating system that uses **SELinux**, as described below.

Note that previous versions of this installation guide differed in two ways from the above:

- Previously, it was suggested that you should use **mod_jk** to connect **Apache HTTP** server with your servlet container (such as **Apache Tomcat**). This is no longer recommended. In particular, **mod_jk** isn't available for recent versions of **Red Hat Linux** and **CentOS**. That is why the above recommended **Apache** configuration uses **mod_proxy_http**.

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- It used to be a requirement that **http** access was required, at least from `localhost`, even when you only wanted **https** access to be remotely accessible. This requirement no longer exists so you only need to configure the **SSL VirtualHost** with the above directives if you only want to provide **SSL** access.

## SELinux Settings

If you are running a version of **Linux** that uses SELinux, then you may find that your **Apache HTTP** server is prevented from opening further **http** connections, thereby stopping the above from working. You can check whether you will need to do this by running this command:

```
getsebool httpd_can_network_connect
```

If this returns zero or off, then you will need to change this setting by running this command:

```
setsebool -P httpd_can_network_connect 1
```

You can read about the `httpd_can_network_connect` setting on the httpd_selinux man page. If your `httpd_can_network_connect` setting is zero or off, then the result will be an error in your **Apache** logs similar to this:

```
(13)Permission denied: proxy: HTTP: attempt to connect to 127.0.0.1:8080 (localhos
```

## Rebooting

Finally, you will need to arrange for **MySQL**, **Tomcat** and **Apache** to be started each time your operating system boots. You should follow the standard method for your platform. For **Windows**, this means they should all have been installed as services.

## Advanced Apache Configuration

Sometimes, you may have an external-facing **Apache HTTP** server through which all of your traffic flows (eg on a firewall) and then internally you may have another **Apache HTTP** server that has the **mod_jk** module installed. In this situation, with two **Apache HTTP** servers and one **Tomcat** server, there is some extra configuration to do. Without any extra configuration, **Tomcat** will always be given the IP address of the firewall **Apache HTTP** server as the source of each request instead of that of the user's computer. The problem with such a situation is that the login attempts that **Exprodo DB** will record will all show the firewall as the source of every attempt. For defence against any attack, it would be better to change this.

You can set up forwarding of **HTTP** requests from the firewall to the inner **Apache HTTP** server in two ways: by configuring a reverse proxy with the **ProxyPass** directive, or with **mod_rewrite** and the [P] directive.

If you use **ProxyPass**, then you can make a configuration change on the firewall **Apache HTTP** server by adding the directive

```
ProxyPreserveHost On
```

to the appropriate part of the firewall's **Apache HTTP** server configuration.

This situation is described here:

```
http://tomcat.apache.org/connectors-doc/generic_howto/proxy.html
```

You may be able to achieve the desired effect with **SetEnv** or **SetEnvIf** directives instead of the above (but I have not tested this).

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Once you have done this, you can check whether this is working as expected in one of two ways. First, you can look at entries that appear in the **login_attempts** table whenever somebody tries to login to **Exprodo DB**. Secondly, you can check from **Exprodo DB** by using either the Search 27 page or the Data Explorer 46 page.

## Upgrading Exprodo DB

Upgrades follow the following path:

1. Stop **Tomcat**
2. Take a backup of your **MySQL** database:

   ```
   mysqldump -u root --password=somepassword db > db.saved.sql
   ```

3. Apply any database upgrade script provided for your release. For a release of version "a.b.c", this would mean:

   ```
   mysql -u root --password=somepassword db < update-a.b.c.sql
   ```

4. Replace the **DB** directory with the contents of the new **DB** directory. Note that you must ensure that the `hibernate.cfg.xml` file that you customised when you followed the above installation instructions is not overwritten by the new release. New releases normally do not include a copy of `hibernate.cfg.xml` file.
5. Restart **Tomcat**
6. Open a web browser to confirm that **Exprodo DB** is accepting connections

## Rolling Back a Failure Database Upgrade

If you should want to roll back the database because an upgrade failed in some way, then you should *not* load you back-up over the top of the upgraded database. That's because there could be tables for the upgrade that remain in place, and so it might cause problems with doing the upgrade again (since it may assume the new tables do not exist).

The recommended way to roll back the database after an upgrade is to drop the database, recreate it, and then load the backup.

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# Part VI

# 6 Glossary

| Term | Definition |
|---|---|
| Action | See Permission Action[251]. |
| Applies To | Defines the list of users that are will affected. This list is overruled by the Does Not Apply To[250] list. ie. If a user is in both lists then the Does Not Apply To[250] is used. |
| Approved Booking | A **Calpendo** booking[250] whose status is approved. |
| Approved User | A user that has been approved for access to the system. |
| Bakery | An editor which allows the user to create, delete and update BiskitDefs[250] and their properties[252]. The Bakery also allows editing of Mapped Strings[251], Mapped Integers[251] and Units[252]. |
| Biskit | A Biskit is an object stored in the database that has a custom type. It will have whatever properties[252] are specified by its BiskitDef[250]. |
| BiskitDef | Defines the properties[252] associated with a particular type of Biskit[250] and how those properties[252] should be stored in the database. |
| Biskit Type | Each Biskit[250] has a type. Biskits[250] with the same type, have the same property[252] definitions. See BiskitDef[250]. |
| Bit Set | A Bit Set is a type of integer property[252] that results in a drop-down that can take multiple values. |
| Booker | A **Calpendo** concept defining which user has made a particular booking[250]. |
| Booking | A **Calpendo** concept of a reservation of a resource[252] at a particular time. |
| Bookings Calendar | A **Calpendo** page which provides a graphical view of bookings[250] by day, week or month. |
| Booking Rule | A **Calpendo** concept, setting up restrictions relating to which bookings[250] can be made. |
| Booking Status | A **Calpendo** concept that shows the condition of the booking[250]. |
| Booking Type | A user-defined Booking[250] taxonomy. |
| Bookmark | A **Calpendo** concept defining a collection of resources[252] to be displayed in the Bookings Calendar[250]. |
| Condition | Allows the user to specify under what circumstances an action such as generating an email, granting or refusing permission[251] etc. will occur. Conditions work logically together using information from the database to reach a True/False result. |
| Data Explorer | A page that shows Biskits.[250] |
| Data Type | See Biskit Type[250]. |
| Does Not Apply To | Defines the list of users that an operation (Rule[250], Permission[251] etc) will not affect. This list overrules the Applies To[250] list. ie. If a user is in both lists then the Does Not Apply To is used. |
| Event | An **Exprodo SDM** concept which defines a when a task[252] needs to occur. |

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| | |
|---|---|
| FAQ | Frequently Asked Questions, this page lists the FAQ's for the facility. |
| Global Preferences | Specifies settings that change the way **Exprodo DB** operates. |
| Group Report | A report that lets you break down data by any number of properties[252]. |
| History | The audit log kept by **Exprodo DB** that shows what has been changed, when and by whom. |
| Layout Editor | The Layout Editor allows the user to define how the properties[252] of a Biskit[250] will be displayed. |
| List Report | A report that shows a list of Biskits[250]. |
| Mapped Integer | A Mapped Integer relates text labels to integer values. An integer property on a Biskit[250] may use a Mapped Integer so that a user would see a drop-down with each of the text labels when they edit it. The related integer value is stored in the database rather than the text. See also Bit Set[250]. |
| Mapped String | Similar in concept to a Mapped Integer[251], but instead of storing an integer in the database, a text value is stored instead. This means that a Mapped String is an association of one set of strings to another set of strings so that you see a drop-down of text values, but the value stored in the database does not have to be the same as the displayed value. |
| Meta-Property | 1) Attributes that define how a Biskit[250] or a Biskit's[250] properties[252] work.<br>2) A type of property used in Conditions[250] when you want to specify a relation[252] about who performs an action or when. |
| Network Metrics | A record of how long communications between web browsers and the **Exprodo DB** server take. |
| Nobody | A special user used for Permissions[251] to control what information may be written into emails. |
| Owner | A **Calpendo** concept defining who owns a booking[250], bookmark[250] or project[251]. |
| Permission | How the administrator determines which user may have access to what information and under which circumstances. Permissions may have many layers allowing fine grained control over who can perform what action[250] on which Biskit[250]. |
| Permission Action | An operation that can be performed on a Biskit[250]. The most common actions are Create, Read, Update and Delete. |
| Project | A **Calpendo** concept, a project allows an administrator to link together users, resources[252] and costs. |
| Project Group | A **Calpendo** concept grouping similar projects[251] together for use in Rules[250], Permissions[251], Time Templates[252] or Automatic Emails. A project[251] may belong to many groups. See also Project Type[252]. |
| Project Resource Settings | A **Calpendo** concept creating a list of resources[252] that a project[251] may use with project specific information for that resource. |
| Project Status | A **Calpendo** concept showing the current status of a |

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| | |
|---|---|
| | project. This can be **Requested**, **Approved**, **Denied**, **Unbookable** or **Terminated**. |
| Project Type | A **Calpendo** concept grouping similar projects[251] together. A project has only one type. See also Project Group[251]. |
| Property | An individual piece of data attached to a Biskit[250]. A property will have a name, a type and a label as well as other meta properties[251] defining how it is organised. |
| Property Path | When adding a property[252] to a report, or placing a condition[250] on a property[252], you can choose a property[252] of a property[252]. This is known as a property path. For example, if you want a Permission[251] to prevent creating reports that are scheduled to run daily, you would need a condition[250] on the the report schedule's repeat type. This is found in the property path **reportSchedule.repeat.repeatType**. |
| References | Biskit[250] properties[252] may have various types, such as integer and string. One such type is Biskit[250], which means that a Biskit[250] may reference another Biskit[250]. The References for a Biskit[250] is the list of all such referencing Biskits[250]. |
| Relation | Provides a means of comparing the value of a property[252] to another value e.g. equals, less than etc. |
| Repeat | Something that occurs at regular time intervals. |
| Requested Booking | A **Calpendo** concept of A booking[250] that has been created but not yet approved[250]. |
| Resource | A **Calpendo** concept, defining a room, person, instrument, or anything else that that must be booked before it can be used. |
| Settings | See User Settings[253]. |
| Single Item Report | Shows a report of a single item of the appropriate Biskit Type[250]. |
| Summary Report | A report like a spreadsheet pivot table that can automatically count or sum data. |
| System Event | Various things that happen within **Exprodo DB** are recorded as a System Event. For example, a system event is recorded each time an email is sent or an error is detected. |
| System Usage Statistics | These are statistics that may optionally be kept to track how much each user has been using **Exprodo DB**. |
| Task | An **Exprodo SDM** concept of an individual action that needs to be performed. See also Event.[250] |
| Time Template | A **Calpendo** concept allowing an administrator to assign an acceptability rating to bookings[250] depending on when they are booked, who makes the booking and the project[251] the booking is for. |
| Units | A method of displaying different measurement types such as feet and metres. |
| User Approval Process | The process by which new users become approved. |
| User Group | A way of grouping similar users together. A user may belong to many groups. See also User Type[253]. |

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| | |
|---|---|
| User Project Association | A **Calpendo** concept which contains a list of projects[251] the user is associated with. |
| User Roles | Users may be assigned roles, and then Permissions[251] can be configured to use those Rules. For example, by default, users with the **Admin** role[253] can modify more things than users without the **Admin** role. |
| User Settings | Specifies settings that change the way **Exprodo DB** operates for this user. These will override the Global Preferences[251]. |
| User Status | The current status of the users account. This may be one of Requested, Normal, Password must be reset at next login, Blocked or Denied. |
| User Type | A way of grouping similar users together. A user has one type. See also User Group[252]. |

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# Index

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